

THE IRON AGE

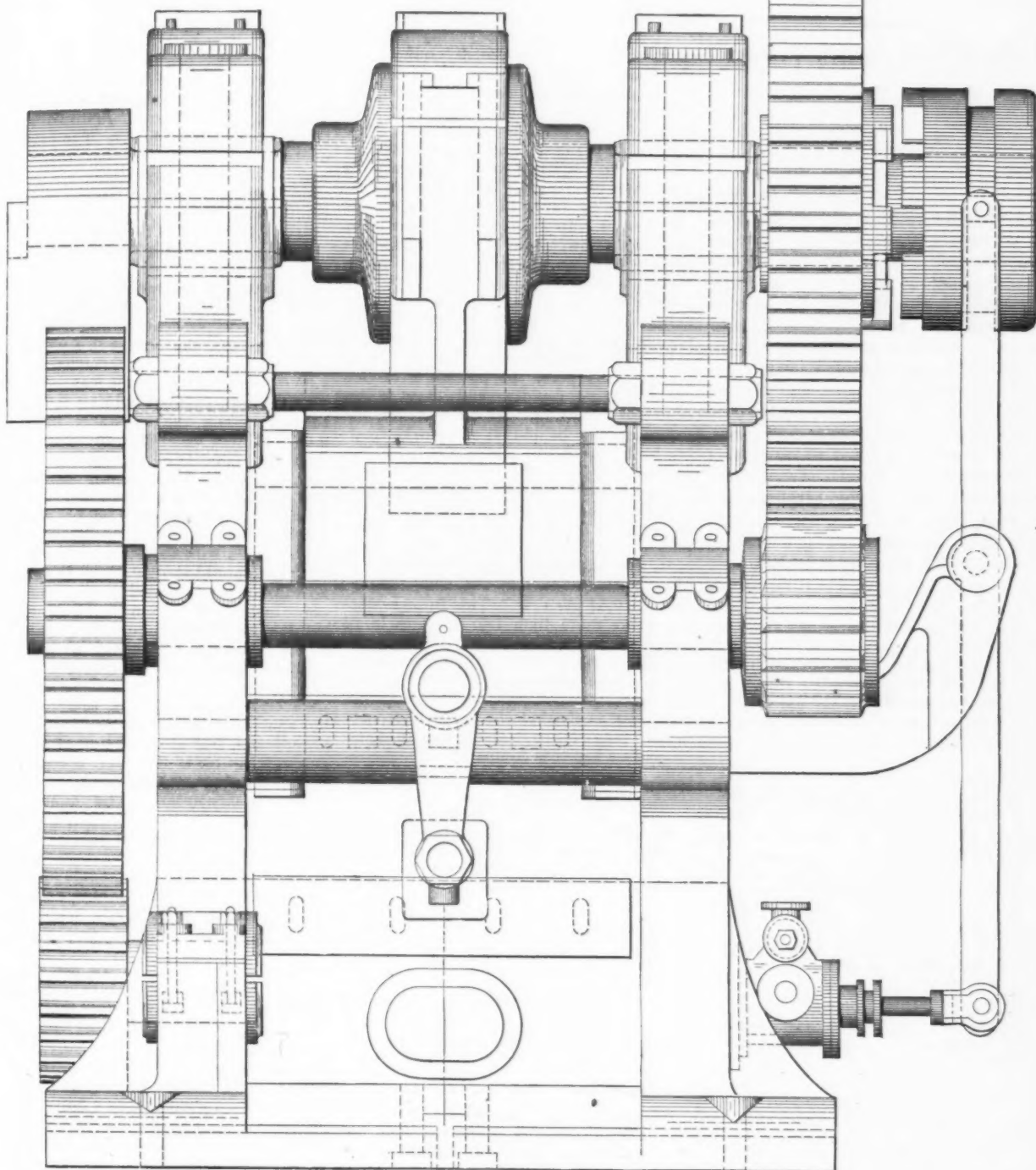
THURSDAY, AUGUST 21, 1890.

Steel Bloom Shear.

We present herewith drawings of a Steel Bloom Shear recently built for the Fort Payne Rolling Mill Company, of Fort Payne, Ala., by the Totten & Hogg Iron and Steel Foundry Company, of Pittsburgh, Pa. The construction of the shear is shown so clearly in the illustrations that very little descriptive matter is necessary. All of the bearing surfaces are of brass. Large steel bolts have been put

The roller table is driven by friction clutch, all of which are made of the best material. The knives open 9½ inches and will cut a section of hot steel 7 x 10 inches and plates 30 inches wide.

The new four-track elevated railroad supported by ponderous bolted iron trusses, in course of erection in Jersey City by the Pennsylvania Railroad, is making rapid progress. A permanent depot building of masonry will displace the wooden struct-



STEEL BLOOM SHEAR.

on the shear to take the strain when cutting. The gearing is 16 to 1 on the revolution of the engine shaft. The clutch is thrown into gear by a steam cylinder without any delay. It is driven by a 16 x 16 vertical engine, with heavy fly wheel.

ures. The new station will cost upward of \$1,000,000.

The Argentine Republic possesses recuperative power in a high degree by reason of her agricultural resources. Her exports

of wool, hides, tallow and cattle are on a large scale, the result of a rapid increase of her farming population through European immigration. - The total value of the foreign commerce for 1888 was \$280,697,212, of which the movement of gold coin

and bullion represented \$53,000,000. The imports were \$127,507,860, or \$10,000,000 more than the previous year, an increase clearly due to the purchase of such machinery as would add to the productive capacity of the country. In proof of this it may be stated that the imports of agricultural machinery, which in 1889 amounted to \$14,359,356, reached a total, in 1888, of \$17,552,857, while there was a notable falling off in the imports of manufactured goods. The exports exclusive of specie in 1888, free of duty, amounted to \$99,556,377, while in 1889 the exports, partially subject to duty, were \$84,206,172, or an increase of \$15,350,205. The aggregate value of the foreign trade during the first quarter of 1889 was \$86,168,000, or an increase over the corresponding period of the previous year of \$22,636,000, a remarkable growth.

The Basic Open Hearth Process.*

BY N. KJELLBERG.

(Concluded).

Making Repairs.—Repairs after tapping must be expedited as much as possible. Even while the hearth is still covered with slag the repairs of the fire bridge are begun, followed quickly by any repairs necessary along the level which the cylinder occupies during the charge. As soon as the slag itself has been removed, basic material is scattered over the hearth. If the hearth is considerably damaged, the practice at some works is to charge a part of the limestone before putting in the iron, using it to fill out any holes or depressions. It is not usually considered necessary that the material freshly introduced should cinder to the old lining. The charging of the iron itself begins in the regular way. At one establishment this charging was begun even before the tapping hole had been closed, and before the repairs at the side of the working doors had been made. These repairs occur at every charge and take considerable time. A comparison of the different materials, so far as they effect repairs, is in favor of magnesite. The opinion is gaining ground that the use of tar is rather injurious, since the smoke conceals some of the parts of the hearth which need repair.

Time Required.—The following data relate to three works at which the basic process is successfully handled. They are the averages of a series of charges in each case:

	No. 1. Magne- site lin- ing.	No. 2. Magne- site lin- ing.	No. 3. Dolo- mite lin- ing.
Capacity of furnace, tons.....	6.8	11	7.5
Material charged:			
Pig, per cent.....	27	40	37
Scrap ".....	73	60	63
Phosphorus con- tents.....	0.4	0.134	low
Repairs—minutes...	30	15	15
Sintering lining— minutes.....	45
Charging stock— minutes.....	75	70	45
Melting charge.....	105-135	195	210-240
Finishing.....	80	45	75-90
Total time—hours..	5½-6	5½	6

No. 1 is the Diosgyoer furnace, an average of 10 charges, No. 2 is an average of 5 and No. 3 an average of 10 charges.

The long time for charging at the first establishment grows out of the fact that the materials are preheated in another furnace. The short time required for melt-

ing down the charge is the result of this preheating, and is partly due also to the fact that 10 per cent. of the charge is added subsequently, so that the first melting does not deal with the whole charge.

In 5½ hours from tapping the tap, establishment No. 2 makes on an average 4½ charges of 11 tons per 24 hours. A second furnace at the same works, with larger regenerators, was idle during Mr. Kjellberg's visit. It works a little faster and generally makes 4½ charges in 24 hours. Other reliable data on this subject are obtained from the Rhenish Provinces. An establishment there makes 4½ to 5 charges of 9 tons each in 24 hours, the charges consisting of 18 per cent. of pig and 82 per cent. of scrap without any addition of ore. It is true, however, that the material worked does not carry more than 0.5 phosphorus. Another works in the same district puts through 3½ to 4½ charges of 10 tons, consisting of one-third pig and two-thirds scrap. A third and fourth German establishment, one using 43 per cent. mill iron, 57 per cent. scrap and often 0.7 per cent. rich Swedish ore, while the other runs on 30 per cent. mill iron and 70 per cent. scrap, without ore, the charge in both cases carrying 0.2 to 0.3 phosphorus, make daily 2½ to 14 to 15 ton and three 13 ton charges. In France work seems to be done more slowly, two charges in 24 hours being a common practice, although 2½ to 3 charges do occur.

Whatever good records are made the material itself is generally low in phosphorus, never going above 4 per cent. When the materials are low in phosphorus, and pure, the process is carried through more rapidly, and there is less injury to the lining. As an instance, the following may be quoted of a works treating high phosphorus material in a 20-ton furnace, and iron with 0.05 phosphorus in a 9-ton furnace, both of them being lined with basic material: In the large furnace 25 per cent. of pig, with 2 per cent. phosphorus, is charged, together with 75 per cent. low phosphorus scrap, so that the phosphorus contents of the whole charge is about 0.54 per cent. This furnace does not make more than two charges in 24 hours, while the smaller one makes 4½ to 5. The engineer at the works gives as the reason for this discrepancy the phosphorus contents of the charge, but it does not seem very likely that the great difference in the time is exclusively due to it, especially when it is compared with the results of the establishment No. 1 in the table printed above. At works No. 1 only 5½ to 6 hours are required to work charges containing 4 per cent. of phosphorus. It is natural that a 20-ton charge requires more time for charging and for melting down such a large quantity of cold material, and that the repairs for so large a furnace occupy more time. Reasoning from analogy, with the basic material it may be assumed that although a considerable part of the phosphorus is removed during the melting of the charge, the large percentage of phosphorus in the iron itself required a longer period of working.

THE ELIMINATION OF IMPURITIES.

Phosphorus.—At one works at which the charge consisted of 80 per cent. of scrap and 20 per cent. of pig iron carrying 2.7 per cent. of phosphorus, the contents of the steel are brought down to 0.02 to 0.03. If it is considered that on an average the phosphorus contents of scrap is 0.05, the average contents of the charge in phosphorus would be 0.58 per cent., so that 95 per cent. of the phosphorus in the charge is eliminated by the process. Another works tried to make good steel with an iron carrying 3 per cent., using scrap and ore. The steel was brought down to 0.10 phosphorus. At

Diosgyoer pure pig is melted with some scrap low in phosphorus and purchased scrap high in it, the charge consisting as follows:

Pig 27, with 0.08 phosphorus.
Rails 44, with 0.8 phosphorus.
Purchased scrap 18, with 0.08 phosphorus.
Own scrap 11, with 6.02 phosphorus.

This makes the average of the phosphorus 0.4 per cent. According to the records of the works the phosphorus in the steel fluctuates between 0.015 and 0.020, so that in 5½ to 6 hours' time of charge nearly 95.5 per cent. of the phosphorus contents are carried into the cinder. At another establishment which also melts very pure pig iron with rails high in phosphorus, the contents of the charge figures at 0.135 phosphorus. The finished steel carried 0.015 to 0.04. Ninety per cent. of the phosphorus is removed, the charge taking five hours. In working mill iron, Swedish ore and own scrap, another works begins with an average phosphorus contents of 0.035. This is brought down for rail steel and tires to 0.03, and for soft steel, first quality, for boiler plate, down to 0.01. The examples quoted seem to prove that there is no limit to the dephosphorization in the basic open hearth furnace, although complete elimination is only attained at the expense of time and of the lining.

Sulphur.—At one of the works quoted above, at which iron high in phosphorus enters into the charge to the extent of about 25 per cent., an effort was made to work with 50 per cent. of pig iron carrying 2 per cent. phosphorus in a 20-ton furnace; but as this pig iron carried 0.15 to 0.35 of sulphur the result was unsatisfactory, the final product holding 0.05 to 0.6 sulphur, while the allowable limit was 0.04. It was necessary, therefore, to reduce the quantity of pig used to 25 per cent. Starting with sulphur contents in the pig of 0.25 per cent., and assuming that the scrap carried 0.03 per cent. of sulphur, the average in the charge figures 0.14, which, with the yield of 94 per cent. of ingot, should show 0.15 in the steel, if no sulphur is eliminated during the process. Instead of this figure, 0.05 to 0.06 sulphur was obtained, and this would lead to the conclusion that about 60 per cent. of the original sulphur contents of the charge was absorbed by the cinder. The basic open hearth process, therefore, does not alone seem to attain the elimination of phosphorus, but also aid that of sulphur, although, so far as the latter is concerned, it does not do so as vigorously.

Fuel Consumption.—The quantity of coal required for the producer gas varies with the calorific value of fuel of the coal itself. With good coal the consumption is 40 to 45 pounds per 100 pounds of ingots. The author quotes results at a number of works running with lignite, which, however, have no interest for American readers.

Output.—Two 11 to 12 ton furnaces making 4½ charges per day each produced in 1888 together 20,000 tons of ingots. The two 6½ ton furnaces at Diosgyoer, which are alternately used, so that only one furnace is always in operation, turned out in 1888 with 4½ charges per day 7400 tons of ingots, which would make a daily product of 21½ tons. Another Hungarian establishment with four 7½ ton furnaces making nearly four charges per day showed the following record:

	No. 1	No. 2	No. 3	No. 4	Total
Tons.	355	4,650	3,675	5,700	17,080
Production.	355	4,650	3,675	5,700	17,080
No. of work- ing weeks.	24¼	33	26	40	123¼

Furnace No. 4 made 1400 charges without important repairs. A Westphalia establishment makes 8000 tons annually, with each of its 10-ton furnaces making 3½ to 4½ charges per day. The yield is 9½ to 95 per cent. of ingots.

* A report of a visit to German, Austrian and French works in 1888-89; papers in the *Jern Konterests Annaler*, 1889, No. 7. Translated for *The Iron Age* by Dr. Leo, of Coblenz, Germany.

Life of the Furnace.—Experience has shown that the arch of the furnaces must frequently require repairs. Next in order for repairs are the walls of the gas and air flues, the walls near the fire bridge and the regenerators. Frequently repairs must be made for local burning of the roof, the whole work taking only a few hours in such a case. It is not possible to give the number of charges applicable to all conditions which represent the life of the different parts of the furnace enumerated, since it varies with local conditions and is subject to accidents. A few examples will serve best to throw light on the subject: At Diosgyoer the lining up to the level of the fire bridge is made of magnesite, the hearth is rammed of magnesite with dolomite and water as a binding material, and the walls and fire bridges are made of magnesite brick. The acid parts are of Dinas masonry. The furnace has a record of 302 charges without any repairs whatever, the average being 250 charges. The middle part of the roof generally lasts three times as long, so that 700 to 800 charges can be made before an entirely new roof becomes necessary. The magnesite hearth was running for two years with 1200 charges and was still in very good condition. During this time, however, minor repairs had been occasionally made in the vicinity of the tapping holes and the fire bridges. The walls between the charging doors were the parts of the furnaces which suffered most and required repairs.

At another establishment the furnaces which have a high roof, but in which gas and air flow into the furnaces in ports, placed side by side, and the hearth of which is stamped of dolomite and the walls built of magnesite brick, local repairs of the roof occur frequently, but are always carried through in a few hours. Furnace No. 1 made 540 charges on the same hearth, and five times required repairs of the roof, the last repair being caused by a hole in the roof. Furnace No. 2 required three local repairs of the roof while making 390 charges on the same hearth. The flues and the generators on one side were thoroughly repaired, because the iron had eaten its way directly through the fire bridge on that side. At furnace 3 the roof was repaired eight times during 934 charges, repairs being carried out simultaneously in the ports and in the generators. The hearth held out well. Furnace 4 made 708 charges on the same hearth and called for three stoppages for repairs, the first after the four hundred and thirty-second charge. The second stoppage followed the six hundred and sixty-fifth charge, the hearth having burned through at two places. In the case of all the four furnaces, the iron had eaten its way through the dolomite hearth; in one case after only 50 charges. A similar accident happened three times during the 540 charges of furnace 1. It is not usually necessary to put out the furnace when such an accident occurs, the damaged part being patched up as rapidly as possible and the new charge being put in at once. It is held that the danger of a breakout is greater immediately after thorough repair, because during that time the furnace has become cold.

At one works the dolomite hearth lasts a whole year without anything but minor repairs and frequent ramming of material near the tapping hole, but if as the result of burning through of the roof a partial renewal is necessary, generally after 120 to 150 charges, the side walls rammed up of dolomite are entirely taken out.

Another establishment in which the hearth and walls are made of dolomite the damaged parts are taken out after four or five months' use, which is also the life of the roof. At the next occasion for repairs, after about seven months from the beginning of the run, the hearth and walls are

taken out and completely renewed. At this works the time required for a charge is nearly eight hours, so that about 400 charges are made before the first time for general repairs, and 800 charges until entire renewal is necessary.

The life of a magnesite hearth is stated by a works in Austria to be one year. A French mill states that a magnesite hearth lasts six to seven months. During this time three charges are made daily, so that 525 to 625 charges represents the life of the hearth, and 250 to 350 charges the life of the magnesite walls. A works in Westphalia reports that its magnesite hearth lasts more than one year, that generally four charges are made per day, so that at least 1200 charges are made on one hearth. A comparison of the different mills leads to the following results: A lime or dolomite hearth shows that it has been strongly corroded at the level of the cinder, and requires tedious repairs. A magnesite hearth is either not damaged at all or shows very little wear.

The Application of the Basic Process.—The basic open hearth process is particularly employed in the manufacture of such products which require exceptionally mild steel. It is, however, occasionally used with advantage for high carbon stock. All work for which formerly soft puddled iron of first quality or Swedish iron was employed is now generally produced of soft open hearth steel. The basic process has in it the element of further development, probably more so than any other method of manufacture, for the following reasons:

1. The basic open hearth method can be employed to utilize a wide range of phosphorus pig iron and scrap low in sulphur.
2. It is particularly well adapted for carrying out the ore process.
3. It is possible to produce from the same raw materials employed in the ordinary acid lined open hearth furnaces in a shorter time a product superior in quality.
4. The conclusion is that the basic open hearth process, by using cheaper raw material and making steel faster, can work more cheaply, other conditions being equal, than the acid method.

A large German works, using both the basic and the acid method, state that their experience was that the ratio of time per unit of product was as 4 to 5. The reason for this result is probably that in the basic process the basic cinder facilitates the elimination of carbon. It may be assumed that the advantage of quicker work is sacrificed whenever the phosphorus contents is large, and it is probable therefore that the basic method is better for raw material, with moderate phosphorus contents, than for material high in that element. The basic open hearth process eliminates the phosphorus from stock already very low in that element, and it carries down both sulphur and silicon. This makes it possible to turn out a product superior in quality to the best steel made from the same materials in the acid furnace, and which is suitable for purposes requiring particularly soft steel. Besides, the cinder produced in the open hearth process generally carries a high percentage of oxide of iron and manganese, so that it is theoretically better for the life of the lining that this cinder comes in contact with basic rather than with acid material. Since it works faster, too, the basic open-hearth process strains the furnace less.

The opinion is frequently expressed that the basic process is suitable only for those districts where materials high in phosphorus are used. This is erroneous. It may be said that, provided price and cost of transportation of the basic furnace material permits it, the basic open hearth method is as suitable in districts with moderately low phosphorus raw material as it is in those characterized by ores high in that element.

At the works visited, the open hearth steel was used for rails, bolts, axles, structural iron, plates, horseshoe nails, sheets, wire nails, rope wire and telegraph and telephone wire, machinery castings, &c. The following analyses show the composition of the steel:

Tire Steel.

Carbon.....	0.4	Phosphorus.....	0.02
Silicon.....	0.07	Manganese.....	0.63
Tensile strength, 74 kg. per square millimeter.			
Elongation in 200 mm., 14 per cent.			

Beams and Axles.

Carbon.....	0.26	Phosphorus.....	0.016
Silicon.....	0.13	Manganese.....	0.95
Tensile strength, 46.6 kg. per square millimeter.			
Elongation, 25 per cent. on 200 mm.			

Soft Stock.

Carbon.....	0.18	Sulphur.....	0.022
Silicon.....	0.01	Copper.....	0.11
Phosphorus.....	0.014	Manganese.....	0.12
Tensile strength, 34 kg.			
Elongation, 29 per cent.			

At another works, with about 0.14 phosphorus in the charges, the following stock was produced:

For Track Bolts.		For Rails.	
Carbon.....	0.12 to 0.14	Carbon.....	0.31
Phosphorus.....	0.012 to 0.010	Silicon.....	0.02
Manganese.....	0.31 to 0.32	Phosphorus.....	0.04
		Manganese.....	0.78

At Diosgyoer, starting with a phosphorus contents of 0.4 in the charge, and adding a small amount of silicon iron even for the softest materials just before tapping, the following is used for soft stock:

Carbon.....	0.14	Sulphur.....	0.02
Silicon.....	0.02	Manganese.....	0.05
Phosphorus.....	0.016	Copper.....	0.04

At the same works the following composition is that of steel castings for rolling mill machinery:

Carbon.....	0.36	Sulphur.....	0.025
Manganese.....	0.55	Silicon.....	0.29
Phosphorus.....	0.029	Copper.....	0.06

An Austrian works produces the following for high class boiler plate:

Carbon.....	0.16	Sulphur.....	0.02
Silicon.....	0.00	Manganese.....	0.26
Phosphorus.....	0.01	Copper.....	0.02

For a 10 ton furnace the following quantities of magnesite are necessary if it is to be built up to the level of the fire bridge with that material: 32,000 pounds brick and 2000 pounds mortar, and if the hearth is to be rammed of magnesite material and the walls to be built of brick, 20,000 pounds stamping material, 14,000 pounds brick and 1000 pounds of mortar.

Some time ago the machinists employed in the different establishments in Pittsburgh and Allegheny made a demand for a reduction in working hours from ten to nine without any reduction in wages. The demand has been acceded to by a majority of the concerns interested, but a few have so far positively refused to grant the demand. Among these are the Westinghouse Machine Company and the Westinghouse Electric and Mfg. Company. These two firms agreed to give their employees an advance in wages which would equal the reduction in working hours granted by the other firms, but so far the men have refused to accept the proposition. A conference will probably be held during the present week, when it is expected that a settlement will be reached.

The Owego, a steel steamship, running as a freight carrier between Buffalo and Chicago, recently made the trip between these two cities, a distance of 889 miles, in 54 hours and 16 minutes, being at the rate of 16½ miles an hour. Nothing could more clearly show the great revolution that is now taking place in the character of the lake marine than a fact like this.

A Mining and Metal Exchange at Chicago.

A meeting was held at the Grand Pacific Hotel, Chicago, on the 14th inst., for the purpose of perfecting arrangements for the

mines is about 180,000 tons per month. The coal produced is of good quality and makes good coke, there being at present 250 ovens operated. Owing to cheap labor the coal can be mined at a small cost, and an offer for abundant coal at \$1 per ton is made to manufacturers locating



SAW SHARPENING MACHINE.—ADJUSTED FOR CIRCULAR SAWS.

establishment of the Chicago Mining and Metal Exchange. E. R. Neely, of New York, a member of the Stock Exchange in that city, is engineering the formation of this new affair, and he has interested several Chicago business men in the plan, among whom are H. O. Matile, A. C. Roy, F. H. Gage, F. M. Gage, W. P. Williams, L. J. Kadish, John Roper, C. A. Whyland, A. H. Kingman and several others from Chicago, besides prominent men from Boston, New York, Denver and other cities. The object of the movement is to make Chicago a center for metals, just as it is for grain and lumber. F. A. Bishop was chosen as chairman and E. R. Neely, secretary. The objects of the meeting were fully explained, and then it was unanimously agreed to form an exchange. A committee, comprising E. R. Neely, W. P. Williams and A. H. Kingman, was appointed to draw articles of incorporation. Another committee, consisting of F. A. Bishop, W. H. Underwood and W. P. Williams, was appointed to secure memberships and explain the affair and its objects. The manufacturers and dealers in metals in Chicago have manifested an interest in the organization of such an exchange, and it looks as if the membership would include all of these men. It is the intention to create not only a market for metals, but for the stock of manufacturing and smelting concerns.

It was decided to offer the first hundred memberships at \$100 each, after which time the price will probably be advanced. A large number of memberships have already been subscribed for. Subscriptions are being made at the office of F. A. Bishop, No. 626 Phoenix Building.

A fund of \$50,000 has been raised by the people of Trinidad, Col., for the purpose of advertising that city as a location for various manufacturing industries. It has been estimated that the coal fields in the immediate vicinity are about 600,000 in extent. The present capacity of the

there. Both hematite and magnetic ores are mined near the town. The location and natural advantages of Trinidad are very good, and it is thought that it will

in time become a manufacturing center of some importance.

The Joint Committee of the Central Traffic Association and the Trunk Lines, including the lake and rail lines, met in Chicago, decided to restore the tariff on iron on September 1 to the figure in effect before the April reduction.

Saw Sharpener.

The saw sharpener here illustrated was designed by the Diebel Sewing Machine and Trimmer Mfg. Company, of Philadelphia, for the purpose of grinding the teeth of either circular or straight saws. It is so arranged as to insure absolute uniformity in the shape and height of the teeth of a saw secured for a given grinding, and this shape can be accurately reproduced until the saw is worn out. Upon the bed plate of the machine are two brackets which support a cylindrical bar to which is fitted a bracket carrying the saw. This bracket can be secured at any point on the bar and can be placed at such a distance from the emery wheel as to allow the sharpening of a saw 6 feet in diameter. By turning the bar in its supports the bracket may be inclined to any desired angle, either way, and as the inclination is indicated upon a graduated scale, the angle can be noted and exactly duplicated at any future time. The bar is vertically adjustable in order to permit the saw to be brought level with the center of the wheel. The small circular plate upon which the saw rests has a conical hole in its center, projecting from which is a stud fitted with a conical collar and nut, the collar serving to center the saw accurately, so that its periphery will be true.

The head which supports the emery wheel spindle swivels on the bed, and is graduated so that the slide upon which the wheel moves when grinding may be placed at any desired angle. There are two slides at right angles to each other, the lower one being used for adjustment of the wheel to position, and moved by a screw and hand wheel, while the upper one is the one used in grinding, and is moved by the hand lever to a stop, which is adjustable. There is also a tooth gauge, which is automatic in its action and can be adjusted to suit any saw.



ADJUSTED FOR SHARPENING STRAIGHT SAWS.

An attachment is provided for grinding straight saws, as shown in one of the engravings. It is bolted to the plate holding the circular saws, and consists of a slide operated by a rack and pinion, and pilot wheel. The slide has a movement sufficient to grind 36 inches, and it may be inclined either way for any level required.

Shop Talk.*

You have all doubtless at times seen most graphically illustrated in *Punch* the "things it were better never to have been said." Possibly before I get through I may say some things which may cause your president to feel that it would have been ever so much better not to have invited an old time machinist to address a class of graduating mechanical engineers.

Now, at the outset, do not understand me as undervaluing education, and that, too, of the very highest class, and especially technical education. I have ever felt the want of it myself, and have ever admired it in others; but for all that I have a most kindly feeling for my Alma Mater, the old time country machine shop, of which to-day there lies not one stone upon another, not one sodden timber rests in the fore-bay, and only the notched recesses cut in the rocks on the river bank remain to show where the old water wheel once slowly turned on its well worn gudgeons; and much as I admire the grand engineering schools of to-day, now that the hard toil of my youth is over, I look back to the old shop with a thankful heart, that amid its grime and dirt, amid its hard work and unpaid service, I learned lessons of patience, of perseverance, of self-reliance and handicraft; and, above all, I learned, under most trying and discouraging circumstances, to close tightly my lips together and inwardly vow that I "would make it go somehow."

To tell you of the old time country machine shop would be to occupy too much of your time; and as you will never look upon it you would not recognize the picture I might bring before you. Of the course of study pursued by the boy who wanted to be an engineer when I was young, I have time to say but a few words. Counting the time occupied in building the kitchen fire in the morning in the home of the "boss," of caring for his horse and milking his cow, to the time when the hour of nine at night rang out from the steeple of the village church, and we blew out our dim, smoky lamps and stumbled over the castings and rubbish with which the shop floor was strewn in our eager haste to get away, we had worked long hours, the eight-hour system not having at that time been invented. There were then and there few opportunities to learn by observation even, for while our shop was as good as any it was primitive enough in its architecture, its general arrangement and especially in its tools.

Were I to tell the class of mechanical engineering of Stevens Institute of the big bull lathe of which we boys knew so well and were so proud of, what I would say would convey to you but little meaning. Should I undertake to describe its wooden ways, with a little strip of flat iron let into the top of the heavy timbers, and the blocks we used to put under the head and tail stock to raise them up when we wanted to bore out an extra large gear wheel, of say 4 feet in diameter, I am sure you would not know what I was talking about, or if I should attempt to describe the hand tools with which our oldest journeyman turned cast iron shafts and gudgeons in this lathe, I am confident it would all be Choctaw to you. Your teachers have never described such tools to you, your books do not contain illustrations of them, and in your workshops and cabinets I see nothing to hint that they ever existed; and so it would be of our upright drills, our makeshift tools of all kinds—they are of the past and their use a forgotten art.

You will find in the literature of to-day a good deal is said about "the rule of

thumb." It has served as a basis for many a jest, and as a text by which to show the vast superiority of the present over the past. I suppose this is another place in which I shall say something "that had better not have been said," but I am talking to-night of the old time workmen who had few or no tools; I am speaking for the dead and gone engineers, who, with their native good sense and active brains, supplemented with skillful hands and the traditional "thumb rule," did accomplish ever so much for their day and generation. As compared with the micrometer measuring machine which stops not short of registering the one-tenth of one-millionth of an inch, or the Vernier calipers whose thousandth of an inch is common every day practice, a flat, wide thumb, grimy with toil and hardened with use, sliding up and down a well worn two foot rule on which the sixteenth marks were worn off, and eighths but dimly seen, the rule of such a thumb does not seem to be strictly accurate or fairly infallible; and yet it was with such a thumb and such a rule George Stephenson built the Rocket, Whitney made the cotton gin, McCormick cobbled up a grain reaper, Fulton an engine and Evans a steamboat; it was by the "rule of thumb" and few tools the first ideas of machines that have since revolutionized the world were molded into shape and started on their subsequent career of prosperity. There is, however, one thing that should be borne in mind—it does make a vast difference whose thumb it is that makes the rule or molds the machine.

In the West, or what was the West when I was a boy, a good deal was said about a sixth sense; it was there called "horse sense." I do not find in the list of studies as pursued in the modern schools that there exists a professor of "horse sense;" perhaps such teaching is not now necessary, but it was a great aid to the young chaps who years ago wanted to be engineers and could find no schools of engineering to go to. The possession of this sense, whether acquired by experience or observation, or the result of natural instinct, was of great value to a young man when, as a "cub machinist," he had brought to him a job to do the like of which he had never before seen, and for which there were no special or even suitable tools. It came into excellent play as he stood and looked over the work to be done, and, unaided, puzzled himself as to how he should go about it.

Many a time have I seen him pull out his worn rule, slide it over the job before him, then chalk a few figures or a sketch on the vise bench, contract his brow, scratch his bent down head in deepest thought, until suddenly there would come to him, like a revelation, a gleam of satisfaction that would light up his face, smooth his furrowed brow, and he would start out to scan the array of old and odd things with which the shop walls were adorned, would tumble out the accumulated scrap which had found refuge under the vise bench, would dig to the bottom of the old scrap pile in the corner, which had in it a little of everything, selecting from one place in it an odd gear wheel, a crank handle from another, to which he would add a short shaft or a long screw; then, with the aid of the carpenter, a lot of blocks and a few planks, bolted together with long bolts made to do duty as short ones by the stringing on them of old nuts slipped to do duty as washers, he would rig up a jigger on some worn out lathe the like of which had never before been dreamed of. And all this under a sharp cross fire of wit, puns and queries from his mates, who discussed with each other across the shop, in terms and tones meant for his ear, their ideas and imaginings as to what the "cub" was up to, and what he would have when he got through.

I have seen, too, the culmination of his improvised contrivance, which, tied up with ropes and hitched up with odd pieces of old belts, when started up, did just what the young genius who had gathered them together expected them to do. And I have seen this possessor of "horse sense," with illy concealed pride, walk up and down the shop floor with his hands in pockets, whistling softly to himself, while his shop mates gathered around his conglomerated machine, whispered to each other in subdued tones, "By gosh, she goes."

As I have previously said, possibly with the wonderful advance in the art of machine tool construction, this kind of "horse sense" is no longer essential; but, after all, it is the province, or should be, of colleges, and technical ones especially, so to train the minds of their students that, not relying on the theories or formulas alone, they will so use them in connection with thought that they shall become aids only in the accomplishment of what comes before them to be done. I cannot conceive of any education that can supplant thinking in the making of a successful engineer. To think, think, think out a problem is the only true way to successfully solve it. Nothing in the profession you have wisely chosen can ever take the place of hard thinking; schools, laboratories, libraries, lectures and such shop practice as you may have had will be of most valued aid when supplemented by hard thinking.

I do not believe all the theories in the world alone could teach one how to drive a nail. Nothing but practice will do that, and even practice without thought will not accomplish it; you must have both combined. When you drive a nail in a board, what do you do? Do you trust to luck that the swinging hammer above your head shall come down on the right place? No. Do you concentrate your thoughts on the hammer circling in the air? No. You concentrate your thoughts and eyes square on the head of the nail you want to hit, and no matter where your hammer is or what curves it describes in the air, if your intense thought is on the spot where the blow should fall, there it will fall; if your thoughts wobble and are uncertain, you will miss the nail or knock it sideways. Did you ever see ranged about an anvil a half dozen stalwart strikers who were called up to help the head smith draw down a large shaft or make a heavy weld? If so, you have seen them ranged in a semi-circle before the anvil, each with his sledge hammer poised in the air, awaiting the nod of the master smith, who, with a small hand hammer, strikes a light blow where he wants the first sledge to strike, and as each swinging sledge falls in rhythmic sequence on the glowing iron, they each fall in the very spot where the hammer of the head smith has last struck, and why? Because each successive striker has fixed his thoughts upon the spot indicated; and as the finished task lies cooling on the earth trodden floor, shaped and completed, it is a beautiful example of what concentrated thought, aided by muscular energy, can accomplish.

And so the man who never had a chance to go to an institute of technical culture, and who, late in life, was asked to say something to a class of engineering students who, more favored, did go to such an institution, and who for want of that early training may have said to-night many things it would have been better not to have said, desires to add but a word more to those he has already spoken, and that is: Prize highly the opportunities you have here enjoyed; they will be of great value in the future if rightly used; but, great as they are, they will not lead you to success if you do not have something of the patience, perseverance, in-

* From an address by J. F. Holloway before the graduating class of Stevens Institute of Technology.

dustury and pluck which alone was the training and the patrimony of the engineers who graduated from out the country machine shops of long ago.

The Steamship Teutonic.

On the 18th inst. the steamship Teutonic, of the White Star line, reached New York from Queenstown, having beaten by a few minutes the record held by the City of Paris. The time made by the latter vessel about a year ago was 5 days 19 hours and 18 minutes, the distance traveled being 2788 miles. The Teutonic traveled 2806 miles in 5 days 19 hours and 5 minutes. The voyage was made doubly interesting by the fact that the City of New York started but a short time before the Teutonic, and was in sight during the first few days. The record of the White Star boat is as follows:

	Knots.
August 8.....	473
August 9.....	496
August 10.....	512
August 11.....	500
August 12.....	485
August 13 to Sandy Hook.....	340

Total..... 2806

The hull of the Teutonic is cut into sections by watertight compartments in a way to secure the maximum of safety, and all the doors can be closed from the flying deck by pulling wire rope lines, which release hooks holding the doors up. The ship is propelled by two sets of triple expansion engines having cylinders 43, 68 and 110 inches in diameter, the stroke being 5 feet. The accompanying rough sketch indicates the arrangement of each engine.

All the cylinders have piston valves, two each to the intermediate and low pressure cylinders and one to the high pressure cylinder. The cylinders are not steam jacketed, a very extended experience serving to convince Harland & Wolff, the builders, that nothing is to be gained from jacketing at sea unless the steam is permitted to blow through the jackets, so as to be constantly renewed. This can only be done in a way to avoid much waste and loss with great difficulty. All the cylinders of the Teutonic are fitted with liners and are air jacketed. The intermediate and low pressure pistons have tail rods, but the high pressure piston has not. All the pistons are covered to impart strength, and have been made as light as is consistent with strength. Each cylinder is carried on cast steel frames. In front is an A frame and at the back a single frame, so that the cylinders are carried each on three points of support, and the "three-legged-stool" principle is called in to give stability, which it does in the fullest degree. The condenser is separate from the engine. It is cylindrical, of brass, some 20 feet long and 7 feet in diameter. The water passes through the tubes three times. There is an air pump at each end, worked by back levers by the high and low pressure engines. These levers also actuate the bilge and sanitary pumps. The boilers are fed by Weir's vertical pumps, but Worthington pumps are also provided. The engines are separated by a longitudinal bulkhead, which rises a few feet above the water line to a point about level with the cylinder covers. The whole of the upper part of the engine room is common to both engines. The engines are placed close together, and the arrangements of the engine rooms are exceedingly good. Access is obtained by winding stairs of ample proportions.

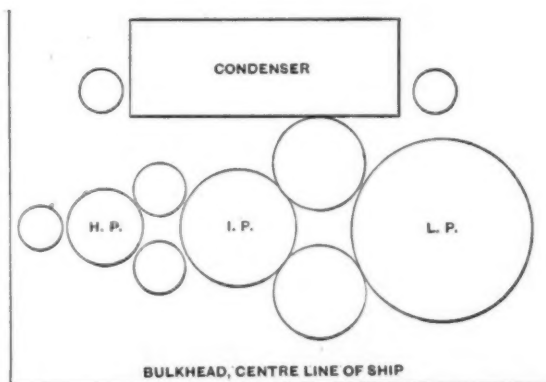
The crank shafts are of Whitworth steel, the crank pins being 22 x 22 inches. The main bearings are not of extravagant length. Indeed, they look short, but it is a noteworthy fact that they have never yet needed a drop of water on them or heated in the slightest degree to give trouble.

The thrust blocks stand in a large open space abaft the engines and under the platform.

The valves of the main engines are driven by the ordinary link motion, with double bar links. Reversing is effected by Brown's hydraulic gear. The screw shafts are placed so close together that the screws overlap 5 feet 6 inches, and the starboard propeller is astern of the other by 6 feet. The propellers revolve "outboard." A large opening is made in the dead wood to allow of this system of construction. There are no stern brackets, the hull being worked out round the screw shaft and fitted with a strong spectacle casting in steel, which carries the stern bearings. There is no screw alley, in the ordinary sense of the word. Each screw shaft, one 199 feet and the other 205 feet long, runs along a wide chamber, close to the outer side, which is the skin of the ship. At the other side is the longitudinal bulkhead, and in the space between this and the shaft are placed ice making machines, and the cold air storage holds are supplied with cold air fans from this department.

The propellers are of manganese bronze, 21 feet 6 inches in diameter and 28 feet

formance of the bows was very beautiful, the waves thrown to port and starboard being comparatively small, the surface water being rolled over that below it without much disturbance. It is proper to explain here that the ship has not been designed to attain an excessive speed in smooth water. She is made rather full below water at the bows and sharp above, the object being to make her buoyant forward, so that she may not bury herself in a head sea, while she is sharp above the water line to reduce resistance to breaking waves. It is common to build a ship sharp below and full above, with the idea that she will lift when she gets fairly into the wave. So she will; but Harland & Wolff hold that it is better to prevent her from burying herself than to let her bury herself first and then lift. It is intended that the Teutonic shall be driven through head seas and that, although she may not be the fastest fair weather boat on the Atlantic, her average speed shall be as great as that of any other steamer, and we see no reason why this end should not be attained in the fullest manner. The Teutonic ran down Channel all right and racing through the water at some 22 miles an



ONE SET OF ENGINES OF THE TEUTONIC.

6 inches pitch, four bladed, modified Griffiths' true screws, with a surface of 128 square feet each. If there were no slip the screws would make 2125 revolutions nearly to the knot. A little over 67 revolutions per minute would give 19 knots per hour. The ship actually traveled through the water at something over 19 knots with 68 revolutions, so that there is very little slip. Steam is supplied at 180 pounds by 12 boilers, with 72 furnaces and a grate area of 1163 square feet. They are worked with so-called forced draft, on a modification of Howden's system, heated air being supplied both above and below the grates by fans. The products of combustion rise through two chimneys oval in section, each 14 feet on the major axis by 11 feet 6 inches wide. Notwithstanding these great dimensions, they look very small compared with the gigantic structure below them.

On her trial the engines were gradually worked up to 65 revolutions, but no attempt whatever was made to drive her. There were no warm bearings, no water was needed, and there was practically no vibration. We anticipated, says the London Engineer, from which we quote, that the peculiar position of the screws would cause a good deal of threshing and give a broken wake, but there was nothing of the kind. In our experience we have never seen a wake with so little disturbance—indeed, it would probably have presented very little difference had the ship been towed instead of driven by screws. It was not easy to realize the fact that something like 10,000 or 11,000 horse-power was being exerted. The per-

hour, the engines making 67 to 69 revolutions per minute.

The Largest Store Building.

It is claimed that Chicago is to have the largest store building in the world. It is to be the new Fair Building, which will be erected at State, Adams and Dearborn streets. The building will have a front of 190 feet on State street, 350 on Adams and 190 on Dearborn street. It was the original intention to erect a 12-story building at a cost of \$2,000,000, but the architect has revised the plans, and it has been decided to put up a 16-story building to cost at least \$3,000,000. The building will be of steel construction, the front to be of stone and terra cotta. The steel alone will cost over \$1,500,000. The building will occupy the entire half block, consisting of 66,500 square feet of land, bounded on three sides by broad streets and on the fourth by an ample alley. The ground rental of the space to be used is \$154,000 per annum, which, capitalized on the basis of the usual 5 per cent., makes the property represent \$3,080,000, to which add the cost of the building and there is found the grand aggregate of over \$6,000,000.

The Bon Marché of Paris is known the world over as the largest structure devoted to retail merchandise, but the new Fair Building will far exceed it in extent, on the basis of the amount of floor space. The Paris building has only four floors, but it covers four blocks, each floor having an area of 108,000 square feet. Each

of the 16 floors of the Fair Building will cover a space of 64,800 square feet, making a grand total of 1,111,600 square feet. This makes the Chicago building almost two and a half times as large as the one in Paris.

The present building at the northeast corner of Dearborn street will be torn down. Then steel foundations will be laid and the new building erected to the height of three stories. It will then be covered with a roof, and the corner at Adams and Dearborn streets will be torn away, three stories built, and half of the front on State street removed. Business will not be discontinued during the three years that the 16-story building will be in process of erection. The Fair will occupy the first six stories and the basement, and offices will take up the remaining ten stories. Forty-three elevators will run in the building. The architecture will be on the simple and plain order. A grand entrance will extend from State to Dearborn streets, and another will run from Adams street to the main passage through the building. There will be an open court through the center. The building is to be fireproof throughout, and will be lighted by a private electric light plant.

Manufactories at South Chicago.

New life, in the form of millions of capital and a score of new manufacturing enterprises, is being infused into the South Chicago district. The semicircle lying on Lake Michigan and around the mouth of the Calumet River will soon have in operation manufacturing interests giving employment to between 8000 and 10,000 men. This semicircle may be described as extending from Eighty-seventh street, the north limit of the Illinois Steel Company's plant, down to about One Hundredth street, including the northern part of the section locally known as the East Side, with its circumference defined by a chain of entirely new or enlarged manufacturing interests. Manufacturers are being attracted to this section by the transportation facilities and the advantages of a location in the West, and new sales of sites suitable for manufacturing or shipping interests are being made frequently. The Calumet River runs directly through this section, and is lined with docks and cross slips. The Baltimore and Ohio, the Lake Shore, the Fort Wayne and other Eastern trunk lines run parallel to the lake, and a bewildering system of cross lines and connecting railroad spurs make it possible for the manufacturer to directly throw his product on to any of the 30 railroads entering the city.

The Illinois Steel Company is, of course, an old established institution, but the Illinois Steel Company of to-day is so far ahead of the enterprise of a year ago in amount of product, men employed, and capital invested that it almost can be classed as a new industry. The plant covers a tract of over 250 acres on the lake shore north of the mouth of the Calumet River, and of this tract one-half has been bought and improved during the last year. A pier costing \$300,000 is being built at the north end of the company's property, extending $\frac{1}{2}$ mile into the lake, and on the harbor formed is in course of erection one of the finest ore docks in the United States. The furnace system has been more than doubled this year, the entire rail and steel mills have been remodeled, new office and laboratory buildings have been erected, and in fact the company has had over 3000 men employed during the last eight months in repairs and in new construction. A plate mill is projected and plans are now in the hands of the company for this addition. The company has a full system of standard and narrow gauge tracks and engines,

and the negotiations for the Baltimore and Ohio property are being carried on with a view of using its roundhouse and shops. This enterprise alone will employ at least 5000 men, with a monthly pay roll of about \$300,000.

Next in location is the new Chicago Refined Metal Company, incorporated with a capital of \$200,000, which will employ from 200 to 500 men. It is located on South Chicago avenue, between Ninety-first and Ninety-second streets, a locality through which the proposed electric street railway line runs. This company makes a specialty of manufacturing dephosphorized iron to be used in place of brass for journal bearings.

The Morden Frog and Crossing and the Porter Boiler Mfg. companies complete the part of the chain west of the river, and, though having been established for some time, are to be improved and extended so as to employ about 500 men. Across the river on the east side is a cluster of three new and exceedingly important industries, which will rival in importance anything in the vicinity. The ship yard located by the Chicago Shipbuilding Company, about a mile from the mouth of the Calumet, is possibly the most interesting and important of the industries springing up in the Calumet region, not only on account of the vast amount of capital invested and the number of men to whom it will give employment, but because it is the initial movement in a line heretofore considered essentially Eastern—the building of steel vessels. The company is now at work on its first contract, two steamers for the Minnesota Steamship Company, to go into the Lake Superior iron ore trade.

Another iron industry which is to aid in making South Chicago a Pittsburgh is just establishing itself on the east side of the river nearer its mouth. It is known as the Iroquois Furnace Company, and has expended \$100,000 for a site, and will immediately put up buildings of equal value. Plans are drawn and work is being pushed forward on the part of the plant to be completed this summer, the furnace and necessary buildings. This company will employ about 1000 men as soon as its plant is completed.

The manufacture of iron in its various forms has been well represented in this chain of industries lying around South Chicago, but the end link is devoted to more precious metals. The Chicago Smelting and Refining Company has been located on the lake shore since last December, and has erected a large plant just north of Ewing avenue, which will employ about 900 men. It will handle gold, silver and copper ores, which are to be shipped to this point by rail.

Of course the establishment and development of these industries have had a marked effect on real estate prices. Acres in this vicinity are sold at front foot prices. The price of property on the business streets of South Chicago now ranges between \$250 and \$350 a foot. Property has advanced at least 50 per cent. all through this section.

Half a hundred members of the Foundrymen's Protective Association recently made up their minds that the firm of G. Shriver & Co., whose foundry is in Fifty-sixth street, near First avenue, should consult the union whenever it wished to hire any new men, and that it must sign a contract with the union to pay a certain scale of wages, an advance of 10 per cent. being demanded at the same time. A committee submitted these demands to the firm, who refused to consider them, but made a demand in return that the walking delegates of the union stop interfering with the business of the firm. The result is that the union men in the foundry quit work in a body, and will continue on strike, so they say, until they win.

The Memory of John Ericsson.

The last of the many honors, titles and decorations received by John Ericsson, the renowned Swedish inventor, will be bestowed next Saturday, August 23, when his mortal remains will be attended by an imposing procession down Broadway to the place of their embarkation at the Battery, where the new steel cruiser Baltimore will be an anchor in readiness to bear them to London. Secretary Tracy, the Minister to London, representatives of the Delamater Iron Works, Thomas F. Rowland, who built the ironclad monitor, will be among those participating in the obsequies. The following characteristic incident is told relating to the contract for building the monitor:

When young man Rowland was ushered into the presence of the inventor, Ericsson, with head and body bent over his drawing board, and surrounded by his papers and professional implements, just raised his head from the table, and casting his eye toward the door to recognize who the visitor was, said:

"Tom, my boy, what are you going to charge me to build my iron ship?"

"Nine cents a pound," responded "Tom" Rowland.

"Tut, tut, Tom," said Ericsson, his brains and hands still working at the angles and curves and circles on his board; "it must be done for 7 $\frac{1}{2}$ cents." And the bargain was at once closed at that figure. So the monitor was put afloat 100 days later by Ericsson, the inventor, Griswold, Winslow and Bushnell, who furnished the material, and young Rowland, the builder.

Mr. Ericsson took equal pride in his Destroyer, which he freely predicted in hearing of the writer of these lines would revolutionize the naval combats of the world, being not only impregnable, but irresistible. It is recorded of him that, even before coming to the United States, he produced nearly 40 different machines and inventions. The so-called Ericsson propeller for many years was recognized as the most approved form of screw propulsion. His solar engine, upon which he labored assiduously, is still an unfinished work. Nevertheless his life work was well rounded, and his memory will survive long after the "storied urn and marble bust" have crumbled.

Irrigation in Western Kansas.

The present season having been an unusually dry one, and many communities having suffered from drought, an opportunity has been offered to make a practical test of irrigation in some counties of Western Kansas and Eastern Colorado, where the experiment had never been tried to any extent before. The results have been uniformly good. In Powers County, Col., this was the first season that irrigation was used. The Arkansas River runs through this county from west to east and it has a fall of about 7 feet per mile. While the water in the river has not been large in volume it has sufficed to cover a large extent of country, and the ditches can irrigate 200,000 acres. The wheat and corn crops have been most satisfactory, and have given a large yield per acre. In the county seat, Lamar, there were sold this season 29 binders by two implement dealers. This year having been an experiment the acreage was not large, but it is thought that next season's planting will test the limit of the ditches.

In Finney County, Kan., some irrigation has been done for several years, but it was not until this season that an extensive use was made of it. The result has been that this county will produce a large crop, while the remainder of the State has fallen below the average very considerably.

A lack of water was felt here, too, on account of the lowness of the water in the river, while in one ditch much water was lost by the breaking of a dam at a time in the spring when water was needed. The ditches are three in number and are respectively 6, 12 and 16 miles in length. The Arkansas River cannot, however, supply all the demand that is made on it for water since so many ditches are tapping it above in Colorado, and to get a sufficient quantity which shall have also a constant flow it is proposed to tap the under flow. There is an immense volume of water which comes from the mountain and which finds its way out underground. Tests have been made which show that this water can be reached in an unlimited quantity at from 6 to 8 feet below the surface all over that section of the State. The natural fall of the land from the mountain slopes to the middle of Kansas is about 7 feet to the mile, and it is intended to make use of this fact in getting water for irrigation. It is proposed to dig large wells to the depth of 25 feet or thereabouts. The water will stand in these to about 18 feet in depth, and it can be run off by striking in with a ditch which shall tap it about 5 feet below the level of the water. A fall of 4 feet will suffice to carry it out with velocity enough to irrigate farms lying to the east of the wells. This plan is believed to be entirely practicable, because pumps of large capacity have been used in large wells without lowering the water in any marked degree, even when running day and night and in the driest season.

Irrigation having been proved a success, the problem now is to get sufficient water, and if this can be had many Western Kansas towns which now look pathetic in their desolateness, with windows and doors boarded up, and fine houses going to decay, can be revived and can take on a new life which shall be more lasting and on a firmer basis than the boom of 1885 and 1886 was able to give them. The Government has done much to keep the people of the drought stricken countries by establishing near Garden City in Finney County, two experimental farms with the purpose of finding cereals and grasses which will grow with very little water. Meadow grasses and various species of hay have been brought from India, Egypt and Europe, and have been planted and watched with care to observe the effect of the dry atmosphere on them. Already some good results have been attained, and in Finney County a considerable average of wheat was harvested on which no water had been turned from the ditches.

The annual election of officers of the Northwestern Plow Association was held on the 14th inst., at the Grand Pacific Hotel, Chicago, resulting in the election of H. T. Noble, of Dixon, Ill., president; D. C. Smith, Pekin, Ill., vice-president; C. W. Mitchell, Dubuque, Iowa, secretary; Ross Hanna, treasurer. The regular business of the company was transacted, the principle feature being a revision of price-lists and regulation of prices and discounts to the trade for the ensuing year. Twenty-one manufacturers are comprised in the organization, which includes a large majority of those located in the States of Illinois, Iowa and Missouri. All of the firms holding memberships were represented at the meeting.

The Connellville coke region has not had a year of such freedom from labor disturbances of a general character for many years as the present one has been. This is attributed to the fact that there has been plenty of work at good wages for all who desired employment, and there was no occasion for agitators to create discontent among the workers.

Electric Riveting Machine.

In *La Lumiere Electrique* we find a description of an electric riveter designed by M. Singre. This machine might very properly be termed an electrically operated hydraulic riveter. The electric motor actuates a screw which moves a plunger in a small cylinder filled with liquid, which is thereby forced into another and larger cylinder, the plunger of which carries the riveting die. By the employment of a

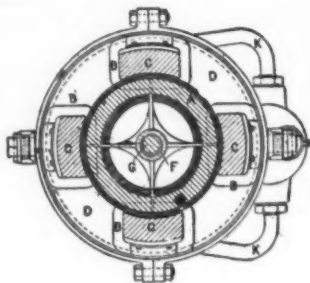
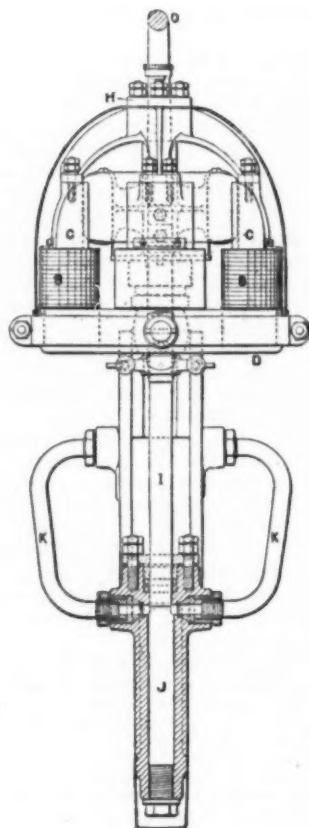
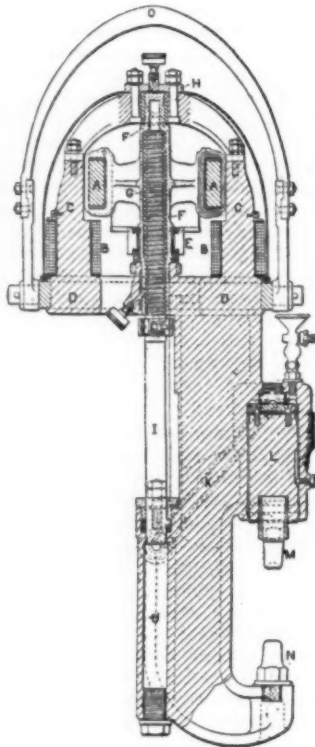


Fig. 1.—Sectional Plan of Motor.



Figs. 2 and 3.—Vertical Sections.

THE SINGRE ELECTRIC RIVETER.

motor of this description, a large mass is given a considerable energy, which is suddenly taken from it by the die coming in contact with the rivet. Fig. 1 is a sectional plan of the motor which has four poles, A being the ring, B the field magnet coils and C the pole pieces. Figs. 2 and 3 are vertical sections, taken at right angles to each other. The shaft of the ring armature consists of a screw-threaded tube maintained in its position at its upper end by the cap H, and below by means of a collar. The commutator is shown at E. In the interior of the screw-threaded tube there is situated a very heavy screw, F, which does not rotate with the ring, being held in a fixed position by

means of the guides shown in Fig. 3. The screw is terminated by a piston, J, which penetrates a reservoir of oil, K, from which lead two tubes, K K. These tubes end in a cylinder in which there moves a piston of large surface, L. The end of this piston carries the die M, which forms the rivet head, the opposite, abutting die, N, being placed at the lower end.

When the current is sent through the motor the latter at once attains a very high speed which increases, owing to the fact that there is scarcely any resistance to overcome, and hence the piston, I, descends very freely at a considerable velocity; but at the moment the die M meets the rivet head it is suddenly stopped; but the ring, the core of which is of iron, and very heavy, has acquired considerable energy during the free descent of piston, I. On the other hand the combination of a screw and hydraulic press makes a powerful combination, which lends itself readily to the exertion of great power with a small initial force.

An enormous magnet at Willett's Point, N. Y., has been formed by winding eight miles of submarine cable around two

heavy Dahlgren guns. It takes a force of 25,000 pounds to pull off the armature, and several solid 15-inch cannon balls are held suspended by it in the air, one under the other.

From a recent issue of the *Pittsburgh Dispatch* we take the following item: "That Pittsburgh has a right to be in a comfortable frame of mind, a few facts and figures will show: The amount of tonnage originating and passing through exceeds that of any other city in the country. She turns out one-fifth of the iron and steel product of the country. One half of the pressed glass of the United States is produced here; also 25 per cent.

of the window glass. Over 5,000,000 tons of coke and about 10,000,000 tons of coal are marketed annually. She has nearly 4000 industrial establishments, with a capital approximating \$150,000,000 and employing 150,000 persons."

NEW ENGLAND MISCELLANY.

The machinery for the plate furnaces has been set up at the Bath Iron Works, Bath, Maine, and this important part of the plant may be called completed. Carpenters are now busy with the framework of the building which is to cover them.

It is reported on good authority that an English syndicate is about to build a factory in Gloucester, Mass., and invest \$375,000 in an industrial enterprise.

The extensive improvements which have been in process for some weeks at the Humphrey Machine Company's foundry, at Keene, N. H., are about completed.

The Salem Foundry and Machine Shop, of Salem, Mass., manufacturers of freight elevators, are meeting with much success with their automatic locking safety gates for elevator openings.

The experiment of using petroleum as fuel, which was tried several years ago by the American Bolt Company, in Lynn, Mass., and which was abandoned as a failure, has been conducted at the United States Cartridge Company's factory successfully for some time past, and has now become thoroughly practical. The crude petroleum costs about 3 cents a gallon when purchased in large quantities. The method used to consume it at the Cartridge Company's works is simple and yet efficient. The oil is pumped into two large tanks holding respectively 5000 and 6000 gallons. It is then conveyed by pipes to the point of consumption and the supply is readily controlled by valves. The pipe, at its termination beneath the boilers, is perforated with minute holes, so that the oil is emitted in the form of spray.

Every traveler must have noticed on some railroad cars, though on very few of them in New England, that the platforms are protected by gates on one or both sides; but, as a general thing, they are clumsy and do not answer the purpose required at all. There are at present 30,000 to 40,000 cars in the country, and of these not more than 2 per cent. are furnished with gates. The subject of these safety gates has received the attention of all railroad men, and they are constantly trying to find out the best one. The gates now used are clumsy, unsightly and expensive, and will not fit all cars, but have to be constructed for the different widths of the platforms. Most of them have a space below between the bottom rail and steps that is large enough for a man to get through, while they are so low that a man could fall over them if thrown sidewise by the sudden jolt of a car. Then, too, many of them clog and will not work smoothly unless looked after every day. The main trouble is that they swing in toward the car, and in case of a crowd trying to rush out quickly, they cannot be opened in time. Then many of them are locked and cannot be opened, save by the conductor or brakeman. A gentleman of Providence, R. I., has invented a gate that railroad men say is the best yet seen. It is called the Goodwin collapsible platform gate, is from 48 to 50 inches high, and stands from the steps straight up. It opens directly toward the brakehead and collapses into a space of 1 inch. In closing it fits any width of platform, and makes a perfect safeguard between the cars. It is being tried extensively on a number of the New England roads.

M. T. Scott, of Bloomington, Ill., has just effected an important deal with a syndicate of English capitalists. Two years ago Mr. Scott purchased what is known as the Cumberland Iron Works, which comprises 46,086 acres of land in Stewart County, Tenn. Of this 26,000 acres are rich agricultural lands and the remainder are mineral lands abounding with beds of iron ore, from which in the past there has been made a fine quality of charcoal iron. A stock company, entitled the Cumberland Lands, Limited, have been incorporated at London, England, with a capital stock of £250,000. All the stockholders are English people, excepting Mr. Scott, who owns one-fifth of the stock and is the resident director. The new company will spend a large sum of money in building furnaces and rolling mills for

the development of them. These lands lie on the Cumberland River, 100 miles above Nashville. Formerly they were owned by John Bell, and were occupied by him at the time he was a candidate for President of the United States. The Cumberland Iron Works, which at one time were quite celebrated, were destroyed during the war, and since then have been worked extensively.

Western Inducements to Factories.

The Western railroad companies are entering heavily into the movement to influence Eastern manufacturers to move West. They are issuing pamphlets setting forth the advantages of the section through which they have run. Even the customary folded time table has remarks upon the subject, as witness the following from that of the Chicago, Burlington and Quincy Railroad of recent issue:

Profit on manufacturing in the New England States is very small; profit on agriculture in the far Western States is also small. The Western producer is too far from the Eastern consumer; he cannot give sufficient to the Eastern producer in exchange for his product. Business is based on an exchange of products, not on money. The farmer in Nebraska has a standing offer of so many bushels of corn in exchange for a good stove; the Massachusetts stovemaker offers his stove for so much corn. The two producers are far apart. Long haulage and speculative centers are between them. The stovemaker wants to eat the corn; the farmer requires the stove to warm his home; both must work very hard to pay the intermediate costs of the exchange; hence both complain that the profits are small. Exchange of products is the fundamental principle of all business. The nearer the producers are to each other, provided they produce diametrically opposite necessities, the greater the profits or the leisure. All the ramifications of trade do not alter this principle one iota. The farmer cannot move his farm to Massachusetts; the factory can, however, move to the West. On the foregoing positive economic principle, that factory located in the West must pay, all ways provided that the enterprise has been undertaken primarily by the man who thoroughly understands his business; that the location has been selected with prudence after earnest study of the country, both in regard to the supply of raw material and the tributary territory available for the disposition of the manufactured product; that sagacity and judgment pervade every movement concerned in the creation of the factory, and that a comprehensive business intelligence guides it toward the highway of success. The discovery of coal in the West has changed all former conditions.

Why do Eastern manufacturers complain that their profits are cut to a smaller margin every year? Why do they say and feel that competition is becoming more and more fierce? Why does it cost so much to sell goods to their Western customers? Why do they feel that Western manufacturers are gradually eating into their trade? Why do they regret that they feel compelled to put their sons in their own factories knowing that the competition is becoming greater and greater; or why, in face of all this, do they establish their sons in branch factories in the East when the more favorable West offers a less competitive market, greater scope for enlargement, a sure field, and that development which is in itself consonant with the development of an ever growing territory? Have they hazy notions of the conditions of the West? The people who buy their goods are chiefly located Westward. There are smaller towns in the West where rent and food for employees are very

cheap. There are towns where slack coal for steam purposes is sold at 90 cents per ton. There are towns where cotton can be laid down cheaper than at manufacturing points in New York State. There are towns where iron is solely wrought, that have a surplus of female labor.

Nearly every manufacturer in the West is doing an ever-increasing and profitable business, but capital is scarce for the development of all the resources of the West. All these towns are seeking to trade with industrial establishments located near them. The West will trade with the West. These towns are the concentric points of five or six railroads, distributing goods all over the United States. They have electric light, gas and water works, fine residence locations, and metropolitan comforts. Illinois, Iowa, Nebraska, Missouri and Kansas offer the best facilities and markets for manufacturing industries. There are towns that will pay a cash bonus to any *bona-fide* factory locating, others that will give free sites, and others that will subscribe stock. There are towns surrounded by coal and raw material in the West right in the midst of the customers of Eastern factories, and others that have inexhaustible water power. Is it consistent with that energy which has made this great country a success to wait until others have filled the field, and then by force of economic exigencies to have to follow to secure what remains, or should this matter be given earnest consideration?

The field for manufacturing in the near future is the West. Immense establishments, doing a prosperous business, are already located there. Let timely action be taken. The Chicago, Burlington and Quincy Railroad Company have already established on their line a large number of prosperous manufacturing enterprises, and desire to increase the number, to the end that the population they serve may be increased, and that their unsurpassed transportation facilities be utilized to their fullest extent. They assure to those proposing to locate on their line the best possible means of communication with the rest of the world, and consider the interests of their patrons so located as identical with their own. They invite correspondence with manufacturers intending to move West, to the end that both parties shall profit thereby.

The Brotherhood of Carpenters and Joiners having initiated the eight-hour movement, which resulted in numerous strikes last spring in Boston, Chicago and elsewhere, the biennial report of general secretary, P. J. McGuire, now submitted to the general convention at Chicago, will be observed with interest. The summary of the report is as follows: In the 144 strikes this season, 208 unions and 57,420 union and non-union men were involved. The eight-hour day has been secured in 36 cities and towns, affecting 23,355 carpenters; the nine-hour day in 234 cities and towns, with, in many instances, eight hours on Saturday, affecting 32,180 carpenters, while gains have been made in 18 other cities, affecting 2662 men. The movement for shorter hours has been successful in 137 cities, and has benefited 46,197 carpenters. The Brotherhood expended \$71,327 in support of trade movements in strikes and lock outs.

The Willard natural gas region, in Canada, is about 13 miles from Buffalo, and the wells drilled are yielding copiously under a high pressure. The gas will be piped across the lake, probably near Fort Erie, and Buffalo is expecting to receive ample supplies for manufacturing and all other purposes. The output of seven big wells already completed is estimated by careful experts at about 27,000,000 feet of gas daily.

THE WEEK.

Erastus Wiman, who of late has taken a deep interest in Canadian affairs, has been speaking freely with reference to the conflict of interests between the American and Canadian railways. He sees no hope of an equitable adjustment until there is an enactment by Canada of regulations similar to those of the Interstate Commerce bill, and this change is expected to come as the result of a defeat of the present Government at Ottawa and the return to power of the Liberal party under Sir Richard Cartwright.

The population of Kansas City, Kan., as announced by the Census Bureau, is 38,170, an increase in ten years of 308.37 per cent. Chattanooga, Tenn., has 29,100 population, an increase of 125.79 per cent.

An iron viaduct to connect Macomb's Dam bridge and St. Nicholas avenue, on Washington Heights, has been commenced and marks a new departure in public improvements, this being the first structure of its kind.

An important rapid transit enterprise is to be prosecuted in Baltimore under the auspices of the Baltimore and Ohio Railroad Company, to cost something like \$5,000,000. The principal feature is an underground tunnel 2 miles in length, together with a long section of depressed track. The time between Washington and New York will be shortened 15 to 20 minutes.

French workmen have put an emphatic veto on the eight-hour movement, as did the English. The English trade societies voted 18 to 17 against an eight-hour agitation or an eight-hour law, though a large number of workmen felt that such a law would be a good thing as a basis for pleas in behalf of extra pay for overtime. A French commission has just obtained votes from Paris workmen on this issue, and out of 7454 only 1767 are in favor of an eight-hour day. The rest either deprecate any legislation or ask for a day of 10, 11 or 12 hours, the latter being the present legal day in France. Both in England and France the professional labor agitators favor the eight-hour movement; but the average man is well aware that what he most needs is not less work but more pay, and more pay in the long run can only come from more work.

F. L. Olmstead's report unfavorable to the choice of the Lake Shore front as a site for the Columbian Fair raises a perplexing question.

The population of the upper part of New England is nearly at a standstill. Vermont is actually retrograding, if the estimate of the census supervisor—323,000—is correct, for the census of 1880 credited the State with 332,286 inhabitants. Maine is not much better off, for its population of 658,454 is an increase of less than 10,000 over 1880.

The slate product of the United States in 1889, as shown by the census report, was valued at nearly \$3,500,000, and considerably more than one-half the slate was produced in Pennsylvania. Roofing slate has doubled in quantity and value within ten years.

Chicago manufacturers are shipping \$130,000 worth of mining machinery to China. A few years ago the Chinese abstained from mining, lest they should disturb the earth's equilibrium.

A number of men who left the employ of the New York Central Railroad last week under "extenuating circumstances" have again entered the service, "not as old men reinstated, but as entirely new employees, and hereafter, with regard to

promotions, discharges, assignments of work, &c., they will be regarded as new men."

Australia's largest building society, at Melbourne, shows a deficit of about \$800,000, the result of official extravagance and speculation.

Neafie & Levy, of Philadelphia, have contracted to build a steel steam yacht, 280 feet in length, for W. W. Durant, of New York, of a palatial description. The propeller will be so adjusted that she can sail with either steam or wind.

Turning the first spade of earth on the Northern Pacific's railway extension took place at Fort Abercrombie, in Montana, a few days ago, promising to give Duluth and the head of Lake Superior another transcontinental route. The construction will proceed as rapidly as possible until the mountains are reached, when the route through the Cascades will be decided upon. The entire line from Duluth to the coast will be in operation by 1892, and Duluth will have three direct transcontinental lines, instead of one, as at present, the Northern Pacific, Great Northern and Canadian Pacific Railway.

By the purchase under foreclosure of the Chicago and Atlantic Railway, which was originally built in the interest of the Erie Railway in the days of President Jewitt, the latter secures an entrance into Chicago and the enjoyment of terminal facilities in that city.

Minister Reid intimates, in the guarded language of diplomacy, that if France places an interdict on American pork the United States Government will feel justified in putting a prohibition on French wines, upon the ground that adulterations are practiced, as charged in the French Senate.

A new English steamship line has been founded under the title of "The Texas Line," to maintain a regular service between Liverpool and Galveston, to meet the growing requirements of the trade with Texas, New Mexico and Arizona, and to foster the increasing business via Galveston to the Republic of Mexico.

The Hudson Suspension Bridge and New England Railway Company are actively pushing the construction of the Peekskill Bridge. The great steel towers, 325 feet in height, have been ordered, and the steel cables, weighing 5700 tons, have been purchased in England.

Colorado has more than doubled her population in the last ten years, rising to 410,809. Washington has gained about 255,000 on a capital, so to speak, of 75,000 in 1880, and now counts about 330,000 people. Oregon has about 270,000 inhabitants, a gain of 75,000 in round figures.

The Government of China is likely to make itself felt in the silver market, it being in contemplation to open a mint for silver coinage, and a loan of 30,000,000 taels is proposed, which would create a large demand for silver bullion.

In the Dominion a new law making important changes in bills of exchange and promissory notes goes into effect September 1. A bill payable to a particular person, but not containing words prohibiting transfer, is to be hereafter negotiable. The holder of a bill containing the name of a referee in case of need was bound to present himself to the latter, but now this formality is optional. Under the old law a forged bill was wholly inoperative, but by an amendment offered by the Senate and assented to by the Commons, if a check payable to order be paid by the drawee upon a forged indorsement out of the funds of the drawer, the latter shall have no right of action against the drawee to recover back the amount so paid unless

he gives notice in writing of such forgery to the drawee within one year of his acquiring notice of such forgery. Hereafter, a bill not accepted on the day of presentment or within two days thereafter must be treated as dishonored for non-acceptance. Heretofore a bill payable on demand could be protested at any time before the statute of limitations was acquired, but under the act it must be protested within a reasonable time. Other changes are of less consequence. The act is modeled upon the English statute, and is regarded by jurists as an admirable piece of commercial law-making.

The Government of Chili has put mining and other industrial machinery and agricultural implements on its free list, affording an opportunity for a more general interchange of products.

As the result of two days' break in the Saulte Ste. Mary's Canal, at Lake Superior, 265 vessels, laden with 250,000 tons of cargo, were detained.

A special course on mechanical engineering, adopted by the Western University of Pennsylvania, is in the same line with instruction given in the numerous trade schools recently established. The instruction given in the shops will extend over carpentry, wood turning, pattern making, molding and founding, forging, metal turning and milling. While the course is not intended to turn out skilled mechanics, it will enable the student to acquire a certain degree of skill and precision which accumulates in meeting new work and develops forethought, which is an indispensable requisite to success.

Three interoceanic lines are under construction in Mexico, besides several trunk and branch lines. This will soon permit the development of the richest section of the country. Trade is increasing.

Another carpenters' strike in Chicago is promised, to take effect September 1, as the bosses are not paying the scale.

The New England Senators are fighting the proposed drawbridge over the Harlem River as an obstruction to railway transportation.

The South Pennsylvania Railroad, which for five years has been a fruitful source of litigation, is now in course of completion, and Pittsburgh editors profess to have discovered "clear indications that the work is being done under the direction and control of the Pennsylvania Railroad. The engineers are nominally in the employment of the Cumberland Valley road, one of the minor ramifications of the great corporation; but they are clearly the employees of the Pennsylvania Railroad." It is further assumed that here is a covert attempt to parallel a competing line in defiance of law, and in disregard of an injunction of the Supreme Court, thus fixing upon the State an alleged odious monopoly. The movement referred to is regarded as having much sensational significance.

The public will not sympathize with the seniority rule promulgated by the Knights of Labor. The Chicago *Tribune* says: "It is both just and humane to recognize long and faithful service and it always should have due consideration, but long service alone is not a prudent or business like basis for promotion. Under the rule of the Knights of Labor all the higher offices and all the important positions on the road and in the company's offices would be filled with graybeards without any regard to physical activity, ability, or energy. What is wanted is young, active, enterprising men who have displayed fitness for promotion."

A Winnipeg despatch says: "Iron is being discovered in all parts of the country between Lake Superior and Lake of the

Woods. Some deposits are extensive. St. Paul, Duluth and Milwaukee capitalists are buying up all the property they can secure in the locality of East Fort William, a new town on the Kaministiquia River, started by the Canadian Pacific Railroad."

MANUFACTURING.

Iron and Steel.

The Vanderbilt Steel and Iron Company, of Birmingham, Ala., expect to blow in their new furnace this week under the management of C. A. Meissner. Work was begun with a survey of ground on February 8, 1890, so that the plant has been built in an exceptionally short time.

The plant of the Spaulding Iron Company, at Brilliant, Jefferson County, Ohio, has been reappraised and the valuation fixed at \$90,000, a reduction of \$43,000 from the former appraisement. It will again be offered for sale on Tuesday, September 2, next.

The Lancaster Iron Company's works, at Lancaster, Ohio, have been appraised at \$33,000. The property will be sold at Youngstown on September 11.

Furnace I, the second of the two new blast furnaces erected by Carnegie Brothers & Co., Limited, at Braddock, Pa., during the present year, was successfully blown in on Friday, the 15th inst. The match was applied by a daughter of J. G. A. Leishman, vice-chairman of the firm. Furnace H, the companion stack, was blown in about two months ago. The completion of these two stacks gives the above firm a total of nine stacks at Braddock, eight of which will be run on Bessemer and have a combined capacity of about 14,000 tons per week. Furnace A will be operated on spiegel and produces about 850 tons per week. In addition to these nine stacks, the Carnegie firms own the two Lucy furnaces, at Pittsburgh, which produce about 3000 tons per week, making a total capacity for both plants of about 18,000 per week, or a total of over 900,000 tons per year, more than one-tenth of all the pig iron made in this country last year. On the day Furnace I was blown in a telegram was received from Andrew Carnegie, dated London, England, in which he sent congratulations and wished the new furnace a successful blast.

The Bethlehem Iron Company, of Bethlehem, Pa., recently turned out successfully a casting which weighed about 125 tons. The casting is to be used as a bed plate for one of the new presses to be used in the ordnance building.

The Vulcan Forge and Iron Works of the Lockport Iron and Steel Company, located at Chartiers, Pittsburgh, have been closed down for repairs. A new set of three-high muck rolls will be erected in the puddling department of 16 furnaces in place of the old ones, which were too small for the increased capacity. Four new puddling furnaces are in course of erection, and ten more will be built when these are lighted. By these improvements the daily capacity will be increased nearly 75 tons.

The Ashley Wire Company, recently located at Joliet, Ill., are putting in the foundations for a main building 195 x 278 feet in size, to be built of stone, brick and iron, and a warehouse 100 x 100 feet. It is expected that the mill will be in operation by November 1.

The Ellis & Lessig Steel and Iron Company, of Pottstown, Pa., have commenced the erection of a new building to enlarge their puddling department. Two more furnaces will be added to the mill, making 22 in all.

The plant of the Belmont Nail Company, at Wheeling, W. Va., has resumed operations after a shut down of about a month for repairs. Extensive repairs have been made in the forge department, new rolls having been put in and two large cranes have been put in position.

The Juniata Iron and Steel Works, of Shoberger & Co., at Pittsburgh, which have been idle for nearly two months, will resume operation during the present week. During the stoppage extensive repairs and improvements have been made. The lifting tables on the large train of plate rolls have been enlarged by an additional length, and there has been erected a continuous roller table, about 100 feet long, to move the plates from the rolls to the trimming shears. This improvement has effected a saving of the work of ten laborers. The department for making horseshoe iron is completed and ready for

work. A portion of the nail factory, which has been idle for some years, has been altered for this purpose. One of the two blast furnaces of the firm is being relined and will be put in operation at an early date.

The plant of the Canonsburg Iron and Steel Company, at Canonsburg, Pa., is still idle and undergoing repairs. Operations will probably be resumed in a week or ten days.

A serious accident occurred at blast furnace No. 2 at the Joliet Works of the Illinois Steel Company on the 12th inst. The fire-brick lining of the furnace, which had been in use for two years, gave way and the molten metal running out exploded when it came in contact with the water around the base of the stack. Considerable damage was done to the plant, one man was instantly killed and another was fatally burned.

Cofrode & Saylor, proprietors of the Philadelphia Bridge Works, at Pottstown, Pa., have received the contract for 16 iron bridges for the Trenton Cut-Off Railroad, the new line which the Pennsylvania Railroad Company are building from their main line at Downingtown, Chester County, to Trenton, N. J. These bridges, several of which will be erected in Chester, Montgomery and Bucks counties, will aggregate about 1000 tons of iron, and will keep the plant of the firm busy for some time to come.

The Braddock Wire Company, of Pittsburgh, have about completed the erection of a wire nail factory at Rankin Station, Pa., which was put in partial operation last week. The new factory contains about 100 wire nail machines, and when they are all in operation they will produce about 1500 kegs of wire nails per day. The departments for making plain and barbed wire are being enlarged and the output will be doubled. The new buildings are about finished and the firm now have one of the most complete plants in the country for the production of wire rods, fence and plain wire and wire nails. The company own a tract of land comprising 9 acres, two-thirds of which is covered by buildings, all of brick. The buildings are large and well adapted to their present use. The building in which the wire and wire nail machines are located is 530 feet long and 160 feet wide at one end and 90 feet wide at the other.

The blast furnace of the Benwood Iron Works, at Martin's Ferry, Ohio, which has been undergoing repairs for some time, was put in blast on Monday, the 18th inst., and is expected to have a very successful run. The puddle mill and nail factory of the above firm, located at Wheeling, W. Va., are in active operation.

The Kenwood Bridge Company, now building bridge works at Grand Crossing, Ill., expect to be ready to begin regular work by the 1st of September. They have their buildings up and the machinery is on cars ready to be put in place.

C. N. Parker and H. W. Topping, of St. Paul, Minn., have recently leased the Union Pacific Railway Company's foundry at Albina, Ore., for a term of five years. They are lessees of the Northern Pacific Railway Company's foundry at Brainerd, Minn., and are also operating a foundry at Tacoma, Wash., in connection with the same company's new shops at that point. This firm will now make all the castings for the entire Northern Pacific system and for the Pacific division of the Union Pacific. They have long been prominent among Western foundrymen, and are now more conspicuous in the trade than ever.

The Prospect Rolling Mill, of Cleveland, was recently sold at receiver's sale to the Ohio and Pennsylvania Coal Company for \$32,000. The purchasers have a claim against the defunct establishment of \$33,000.

The Swift iron plant, of Newport, Ky., which has been closed down since the wreck of the Fidelity Bank and the failure of W. R. Harper, who was one of the principal owners, is to be removed to Duluth. A new company has been organized to control and operate the plant, and articles have been filed by J. J. Sullivan, of Cincinnati; F. M. Williams, William Duffy, of the John Boyle Distilling Company; C. W. Boyd, of Newport; W. L. Wylie, of West Virginia, and Frank Barrett and George J. Atkins, of Duluth. The capital is \$1,000,000. The work of removing the plant will begin October 1. It will be located at Ironton, a new manufacturing suburb now being laid out just west of West Duluth. The Lancaster (Ohio) Steel and Iron Roofing Works will also remove to the same point. A contract was signed a few days ago by which the Atlas Brass and Iron Company, of Kaukauna, Wis., will remove to Duluth.

The Chicago Crucible Steel Casting Company are making satisfactory progress in adjusting insurance matters on their works, which were burned on the 29th ult. Their actual loss will be fully covered by the in-

surance, but they had a good deal of work on hand which has now gone elsewhere, so that they are heavy sufferers otherwise. A very ridiculous report has appeared in some of the Chicago papers since the fire to the effect that up to that very evening their works had been wholly experimental. This is absolutely untrue. The company had built up a good business in furnishing steel castings to many of the most exacting consumers in the West. They expect to rebuild the plant at once and to be in operation in 60 days.

A dolomite brick making machine is being placed in position at the works of the Pennsylvania Steel Company, Steelton, Pa.

The Thomas Iron Company, Hokendauqua, Pa., have placed an order for 700,000 brick for hot blast stoves. The company are also building a large extension to their stock houses.

The semi-monthly pay day, next Saturday, will be the largest in the history of the Pennsylvania Steel Company, Steelton. The rolls foot up \$90,000, divided among 3865 employees, exclusive of Sparrow's Point.

It is reported that R. R. Britton, late president of the Britton Iron and Steel Company, who last spring transferred his interest in the company to J. D. Rockefeller, contemplates the establishment of a steel works at Cleveland, Ohio. Property to the extent of nearly 11 acres has been purchased, and ground will be broken within a few days. A main building 130 x 160 feet will be used as a plate mill, a bar mill and a sheet mill; another building 100 x 150 feet will contain a 1000 horse-power Corliss engine operating an 18 inch bar train. The machinery in the main building will be operated by a 1200 horse-power Reynolds-Corliss engine. An open hearth steel plant will be added early in the spring for making steel for the consumption of the company. Galvanizing works will also be put in. It is expected that the plant will be completed by November 1, at which time 150 men will be employed.

Gordon, Strobel & Laureau, Limited, of Philadelphia, have closed a contract with the Leesport Iron Company, of Leesport, Pa., for a plant of two 18 x 60 Gordon-Whitwell-Cowper fire brick stoves. They have also contracted with Eckert & Brother, Reading, Pa., for two 17 x 60 stoves of the same type; the Junction Iron Company, Mingo Junction, Ohio, for four 30 x 70 fire brick stoves, and with the Lawrence Furnace Company, Lawrence Furnace, Ohio, for two 14 x 60 stoves of the same kind. They have now under construction 28 of these stoves.

The Jefferson Iron Works, at Steubenville, Ohio, were partly destroyed by fire on Tuesday. The rolling and heating departments and one fire proof nail factory were the only portions saved. The loss is estimated at \$100,000; insurance, \$3,000. Over 400 persons are thrown out of employment.

Machinery.

At Pittsburgh last week Judge Acheson, of the United States Court, issued an injunction restraining Struthers, Wells & Co. from committing any further infringement on the engine reversing patent held by Harmon, Gibbs & Co. A previous suit for infringement on the patent was decided in favor of the last named firm.

Ground has been broken for the Sheffield, Ala. Foundry, Machine and Boiler Works.

J. B. Sheriff, Son & Co., of Pittsburgh, dealers in machinery supplies, are enjoying an excellent trade at present. Among their orders received last week was one for 10 syphons for shipment to Lima, Ohio; 12 syphons to Anniston, Ala.; 12 Peerless injectors to New York City; six DeLancey syphons to Houston, Texas, and a 50,000 pound casting order of boiler fronts for Pittsburgh, besides numerous small orders for their well-known injectors and syphons, engines, boilers and sawmills for use in Pittsburgh and vicinity.

Detrick & Harvey Machine Company, of Baltimore, Md., have just completed an extension to their machine shop of 70 x 90 feet. Among other machine tools that they have in course of construction is one of their "F" open side extension planers, to plane 10 x 9 x 25 feet, weight 90,000 pounds, for the Walker Mfg. Company, Cleveland, Ohio, and a similar machine to plane 16 inches long, for the Stearns Mfg. Company, Erie, Pa.; also three threading and slotting machines for guns of 8-inch to 12-inch caliber, for the Watervliet Arsenal, West Troy, N. Y.

The Sioux City Engine Works, of Sioux City, Iowa, are building a boiler works near their shops.

The Hogson & Pettis Mfg. Company, of New Haven, Conn., report the chuck business as being unusually good. They have about finished an addition to their factory 40 x 35 feet, which will be used as the cutting die de-

partment. This will give them a chance to put in some extra machinery, for which they have heretofore had no place.

The new foundry of I. D. Smead & Co., Toledo, Ohio, has been put in operation. The main building of the works is 409 x 67 feet, two and one-half stories in height.

The Filer & Stowell Company, Milwaukee, Wis., are building an addition to their foundry 300 x 100 feet, three stories high.

The Rogers Iron Works, of Muskegon, Mich., have recently completed and set up in their shops a duplex compound pumping engine of a daily capacity of 2,000,000 gallons. The engine is of the well known Wolverine pattern, and is the largest ever made in Muskegon.

Hardware.

The National Bolt, Nut and Rivet Company, of Reading, Pa., have been chartered. The company recently purchased the old Manhattan Hardware Works, which will be remodeled for their purpose.

Miscellaneous.

The Crystal Mining Company have been organized at Youngstown, Ohio, by George Tod, Henry Tod, Henry Stambaugh, J. G. Butler, Jr., W. J. Hitchcock and others to engage in developing iron ore mines in Michigan. The company have secured a valuable tract near the Great Western mine and will push operations. Mining machinery is being placed in position, and they expect to commence taking out ore in a short time.

The \$20,000 car shops to be erected by the Norfolk and Western Railroad at Lambert's Point, Va., will be completed by December 1. When in full blast 500 men will be employed.

The White Wheel Works, situated at Fort Wayne, Ind., were recently burned to the ground. The plant was valued at \$150,000 and was covered by an insurance of \$52,000.

The new spelter furnace recently erected by the Lehigh Zinc and Iron Company, at South Bethlehem, Pa., was lighted up recently to dry out, and the furnace will soon be put in operation.

Among the new corporations recently authorized in Illinois are the following: Wheeler Mfg. Company, at Chicago, to manufacture architectural iron, brass and bronze work; capital stock, \$12,000; incorporators, E. L. Wheeler, E. E. Wheeler and A. J. Motschman. Eaton & Prince Company, at Chicago, to manufacture elevators and do a general machine shop business; capital stock, \$125,000; incorporators, Thomas W. Eaton, F. H. Prince, James M. Walker. The Proctor Steel Tower Company, at Chicago, to erect and operate towers for scenic and scientific purposes; capital stock, \$2,000,000; incorporators, A. P. Davis, E. Norton White and David E. Proctor.

The Illinois Steel Company—Important Changes.

(By Telegraph.)

It is stated on good authority that the Illinois Steel Company will abandon all their works on the north branch of the Chicago River, constituting old plants of North Chicago Rolling Mill Company, except, possibly, the blast furnaces. The rail mill is antiquated and cannot be operated at a profit, and the premises are too contracted to warrant the company in putting up a mill at that point for rolling structural shapes, such as beams, angles, channels, &c. It is the intention of the company to put up a mill for rolling structural steel, and one that will be first class in every particular; but it will probably be erected either at South Chicago or at Joliet, where the company have ample room for such plant. The removal of the works will probably not affect the men now employed, as they will be doubtless required at some of the other plants of the company. The effect of this removal will be to throw open for other uses a large tract of property with dock frontage suitable for manufacturing purposes, as, of course, but a small portion of the land at present owned by the company will be required for the operation of the blast furnaces.

The waning trade of Quebec, particularly in the items of lumber and cattle, is engaging the attention of the Board of Trade.

SOUTHERN MISCELLANY.

The Cumberland Iron Works, at Dover, Tenn., and nearly 50,000 acres of mineral lands in that vicinity, it is stated, have passed into the hands of a new company who are reported organized in London, England, with a capital stock of \$1,250,000. This company intend to establish one or more furnaces, build a rolling mill, open additional mines and develop the property generally.

The Alabama Iron and Railway Company held a meeting of their stockholders recently and decided to issue \$300,000 of bonds for the purpose of adding needed improvements to the three coke furnaces formerly belonging to the Sheffield and Birmingham Coal, Iron and Railway Company.

The Rome Cotton Ties Mfg. Company have been incorporated at Rome, Ga., with \$50,000 capital stock, for the purpose of operating a rolling mill and manufacturing cotton ties. This company have purchased for \$38,500 the Rome Rolling Mill and will considerably enlarge the plant and add improved machinery. The incorporators of the new company are B. A. Jenkins, of Knoxville, Tenn., J. J. Reed, D. R. Beynon and others.

The new furnace of the Cardiff Coal and Iron Company, Cardiff, Tenn., recently begun, is to be 16 x 75 feet. It will have three fire brick stoves, 19 x 70 feet, two blowing engines and five sets of boilers. The work is to be prosecuted as fast as men and money can do it.

The Florence Cotton and Iron Company, of Florence, Ala., have contracted with the Smith & Sharp Mining Company, of Iron City, Ala., for 100,000 tons of iron ore per year for three years.

The Coleman Rolling Mill Company are organizing at South Pittsburg, Tenn., to erect and operate a rolling mill having a daily output of 30 tons. The capital stock of the new company is \$150,000, and Berry Coleman, of St. Louis, Mo., is to be the president.

The Donaldson Iron tract, near Canton, Ga., consisting of 320 acres, is reported sold to J. H. Moore, of Nashville, Tenn., for \$10,000. He is at the head of a syndicate which proposes to organize a company to build and operate furnaces and accomplish other industrial development.

A. K. Lovell and others are organizing a company at Anniston, Ala., to establish a foundry and machine shop at that place.

The National Press and Mold Company, with a capital stock of \$200,000, has been formed at Covington, Ky., for the purpose of establishing a plant for the manufacture of presses and glass molds. The incorporators are H. M. Lewis and H. L. Fritze, of Hamilton County, Ohio.

English capitalists, through their representatives, are securing options on mineral lands in Surry, Wilkes, and Allegheny counties, in northwestern North Carolina, and if the options are taken up it is the plan of the syndicate to make its headquarters at Winston, N. C., where one or more furnaces will be established. This is only 20 miles from Greensboro, where there has been quite a healthy and vigorous iron boom for several months past.

A foundry will be erected at Fernandina by Swearingen & Duryee.

The National Railroad Forging Machine Company, with \$200,000 capital stock, have been incorporated at Covington, Ky., to manufacture railroad forgings. The incorporators are J. S. Pessinger, of Kings County, New York, and H. M. Lewis, of Hamilton County, Ohio.

The Lookout Rolling Mill, of Chattanooga, Tenn., which in this correspondence last week was reported to be removed to Harriman, Tenn., have been reorganized, and the new company have a capital stock of \$200,000. They have perfected all necessary plans for the establishment of the new plant, and the work of erection will begin immediately, and be pushed as speedily as ample capital can do it. The contracts call for the completion of the buildings before December, by which time the company hope to be in operation.

An iron furnace is to be built at Dunlap, Tenn., by the Dunlap Coal, Iron and Railway Company. The same company have decided to erect a number of coke ovens, and will soon begin the development of their coal and iron properties.

The Richmond and Mainville Railroad Company have purchased a site for machine shops at Charlotte, but have not fully decided to put them there. It is stated that there is some prospect of their locating the plant at Winston instead, which is now the center of that system's operations in North Carolina. From that point they are building two roads, one to

Wilkesboro; the other to Mooresville and thence to a point on the North Carolina Railroad, which is under their control. They have recently leased for an extended term of years the road from Greensboro to Winston; so, with these points in view, it looks as if there is some truth in the intimation that the new shops will go to Winston. By the last census this place shows the next largest population in the State.

J. A. George will erect foundry and machine shops at Rome, Ga.

It is stated that the Duthie Engine and Machine Shops, of Knoxville, Tenn., are to be removed to the new iron town of Harriman, Tenn. The Duthie Machine and Foundry Company, with \$20,000, have been organized at Harriman to operate the old plant in its new home.

Fosgate & Lane, tack manufacturers, of Auburn, N. Y., will, it is stated, move their plant to Harriman, Tenn., where it will form the nucleus of the Harriman Tack Company. A new plant building, 40 x 173 feet, will be erected.

The Beaver Lick Gun Company have been organized at White Sulphur Springs, W. Va., with A. C. Snyder as president, H. A. Holt, vice-president, and R. W. Montague as secretary. The new company have acquired possession of 15,000 acres of iron land and 2000 acres of coal land on Deep River and 800 acres of town site property, upon which they propose to build the town of Drewzy. Mines will be opened, coke ovens constructed and a furnace built.

A movement is on foot at Johnson City, Tenn., to organize a company to establish a steel rail mill in that town.

Manganese deposits near Greenville, S. C., are to be developed by a company now being organized by C. T. Ross, W. A. McLees and A. C. Stockman.

Parties at Arkadelphia, Ark., are said to be preparing plans for the establishment of an iron foundry and machine shops in that place.

The manganese developments still go on at Tredegar, Ala. The company there have up to the present opened five manganese mines. Goldsmith Bernard West, general manager of the development company at Tredegar is negotiating for the establishment of a ferromanganese plant, and will come North next week to perfect the arrangements. In addition to the manganese openings this company have been opening a number of hematite ore mines. The outlook for this town is very promising, indeed. Among quite a number of industries that are to be established is a 300-ton steel plant, with rail mill and a cotton tie mill. Work has already commenced on this plant, and upon the arrival of the constructing engineer this week will be pushed to as early a completion as a work of such magnitude will allow. This plant will cover 23 acres.

There is a report current at Cedartown, Ga., that Northern capitalists, through a representative, have bought the ore properties of the Georgia and Alabama Consolidated Mining Company.

South Lowell is the name of a new industrial town to be built by the South Tennessee Land Company. Among the industries to be established is an engine works. The company have a capital stock of \$2,000,000.

There is considerable lead and zinc development in prospect at and around Fayetteville, Ark. J. P. Wood and others have recently organized a company to develop the mines of lead and zinc belonging to Peter Crissatt; John Winkleman is also engaged in opening mines, and the Thomas lead and zinc properties are being worked by other parties.

A company are organizing to establish stove works at Kingston, Tenn.

Referring to a report on the Midway Iron Company, of Roanoke, Va., printed in *The Iron Age*, a correspondent says: "We had some trouble because stockholders refused stock, for the reason that the works are located just out of the city limits." The writer of this letter states that all has been settled agreeably, there being only a delay of two days, long enough to hold a meeting of stockholders. At this meeting R. W. Davies, general manager, was instructed to push matters as fast as possible and double the force of workmen. The machinery for the mill is arriving every day. The buildings will be completed within ten days, one being 70 x 100 feet and the other 70 x 150 feet. The output of this plant will be 30 tons per day."

The Iron Age

New York, Thursday, August 21, 1890.

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RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Index to Vol. LXV.

The *Iron Age* Index, January to June, 1890, is now ready, and will be sent to subscribers on application.

Changes in the Steel Trade.

During the past year or two changes have been wrought in the steel trade which have proceeded quietly, but are not the less significant on that account. There has been a very notable addition to capacity, both by the construction of new works and by the remodeling of old plants. To some extent this has been counterbalanced by certain influences. Nominally the rail capacity of the country is enormous. Actually it is far from being so great. To-day there are only nine concerns turning out rails in any quantity. Some of them may, before long, follow the example set by Troy, Cleveland, Worcester, Vulcan and Springfield, which have practically withdrawn from the rail trade, to which they would only return in seasons of very heavy demand. Some of the old established rail mills have unquestionably failed to keep up in their equipment with the progress of the past decade and they will be soon forced to face the question whether they mean to stay in the business and build practically new plants or whether they will devote their equipment to other purposes. The Illinois Steel Company have only lately completed what is practically a new rail mill, and, as we announce elsewhere, will move the old North Chicago works, only a few years since one of the crack rail mills of the country. The Pennsylvania Steel Company, in their move to the sea, will concentrate their rail manufacture there, and give their older plant in Central Pennsylvania over to other purposes.

The point has been reached in rail manufacture that there is little chance for a mill which is not capable of turning out 800 to 1000 tons a day, and it will not be long before the latter figure is the minimum.

There is one feature, however, which will tend to operate against rapid expansion of daily product. It has become more noticeable from year to year, and particularly so lately. The demand for rails contains a larger percentage of renewal orders. These are relatively small, as compared with the blocks which are purchased for new lines of railway. Since, unfortunately, every road has its own sections, the frequency of small orders involves changing of rolls, with its attendant lowering of product.

The enormous consumption of steel for other purposes, chief among them being the wire trade and its allied industries, has robbed the rail trade of much of its overshadowing importance in this country. At one time the fluctuations in the demand for rails controlled the entire trade. They are very important still in their influence. They may in fact again become the determining factor, under special conditions. But the rail requirements now call for only a part of the steel and the raw material from which it is made.

Rail manufacturers are now generally, we believe, departing from the policy pursued by them of regarding the soft steel trade as a welcome adjunct to the rail business when the latter happens to be slack, to be promptly dropped as soon as orders for rails are taking care of capacity. The tendency is to utilize for that purpose older parts of the plant, and to provide for rail manufacture equipment specially designed for the purpose.

The course of development during the past ten years in the rail trade has illustrated in the most striking manner what a tremendous destruction of capital our rapid progress in mechanical appliances involves. Costly machinery is obsolete long before it is worn out. Those manufacturers only can hope to survive who write off in the most liberal manner or who spend annually large sums in improvements. Few realize how large they are with some of our progressive ironmasters, but the contrast is painful when visiting the works of those who have failed to do so. They may be interesting as monuments of past practice, but must ultimately prove a dangerous drag on the resources of even the wealthiest concerns.

Canadian Transportation.

Canadian trade relations with the United States are the source of much worryment, on account of threats of non-intercourse. But in most cases there is some ulterior purpose in view, as special interests may dictate. A Washington correspondent, summarizing recent developments, says: "Some of our statesmen who are profoundly ignorant of the interests and necessities of New England persist in stirring up the question of Canadian transportation about every six months. Senator Cullom, of Illinois, has just given the matter prominence again by drawing from Secretary Windom a letter in regard to the legality of the transit privileges enjoyed by the Canadian Pacific and Grand Trunk railways. Secretary Windom suggests the possibility that he may cut off the privileges of the Canadian Pacific by revoking the powers exercised by the consular agent of the United States at Vancouver, but he is not likely to act in the matter when he comes to examine the treaties, laws and regulations under which existing privileges are granted. These powers rest upon the plain language of Article 29 of the treaty of Washington, and there is no reasonable doubt that the article is still in force." The Canadian ministerial organ in Montreal refers to the subject and says that while it is possible that the Treasury regulations may be so amended as to dis-

arrange the traffic with China and Japan carried over the Canadian Pacific Railway the matter is by no means important, as the withdrawal of the American agent at Vancouver would only "transfer the bonding to a United States frontier port." The threats involved, we are told, are becoming somewhat familiar, and have little effect. It would seem desirable, in the interests of trade, that this ceaseless making of faces across the boundary line and the calling of hard names should give place to some well defined policy consistent with the national dignity and self respect. Constant badgering becomes tiresome.

The Knights' Dilemma.

Doubtless a crisis impends in the labor world of unusual portent. In the management of its affairs the New York Central Railroad Company finds itself confronted by the Knights of Labor, who are prepared—but hesitate—to join issue on the vital question whether the employer shall manage his own business, subject to no dictation from an outside source. Vice-President Webb, to whom the subject is referred, in a letter to Mr. Powderly under date August 18 says: "The management of this company do not deem it consistent with its continuance and prosperity in business, and with the discharge of the duties it owes to the people, to submit the propriety of its action in the discharge of any of the employees to arbitration." Any final decision upon an issue of this character by the contracting parties represented in this controversy becomes of general significance, affecting all industries in their minutest ramifications. None can afford to be indifferent.

At this time of writing the Knights are in a dilemma. In their first contest with the New York Central Railroad the Knights impaled themselves on a principle that could not be successfully assailed. The right to employ and discharge labor is one that cannot be surrendered on a simple demand. Personally the Knights hesitate to join battle on ground so untenable. Grand Master Workman Powderly is represented as shifting upon Grand Chief Sargent, of the Federation of Railway Employees, the responsibility of declaring hostilities. Mr. Powderly says: "We have made him our spokesman," with the apparent object of enlisting all labor organizations in a single decisive struggle. On the part of the Central the gauntlet has been flung. The corporation 'does not propose to turn over the management of the road' to other parties. J. J. Holland, of the General Executive Board, is 'greatly disappointed' that the Brotherhood of Locomotive Engineers did not come out when the strike was ordered. Chief Arthur as yet sees no adequate grievance. If the issue could only be shifted the way of duty might be plain. But the perplexing circumstance is that probably few other corporations can be named who have shown so much consideration for their men, which have been more just in their dealings as between one man and another, of whatever grade.

Employers, as well as those working men who are not members of societies,

have a deep interest in the outcome of the struggle. At the outstart it was wretchedly managed by the representatives of the Knights. The intervention of the higher officials to apply to its management greater skill, or to secure, at least, an orderly retreat, has only rendered matters worse. The sympathy of the business community is with the railroad, who are entitled to as great a victory as Hoxie won in the West on practically the same issue.

The New Bill of Lading.

The obnoxious bill of lading which the railroad companies have been endeavoring to put in effect has at last been modified in important particulars. A meeting of the Joint Committee of the Trunk Lines and Central Traffic Association was held in Chicago on Thursday last to consider the numerous objections to the bill which have been vigorously made by all classes of shippers, but particularly by Western merchants. Probably the protests of these shippers would not have been so effectual in securing this meeting nor in obtaining the desired modifications if several of the leading railroad companies had not found that trade was rapidly being diverted from them to other lines. The old scheme of a boycott was again being resorted to by the aggrieved shippers to force their powerful opponents to terms. President Newell, of the Lake Shore, admitted the force of the boycott in his speech at the meeting, in which he said that his company would not continue to fight the shippers in view of the fact that a number of the railroads and nearly all the lake transportation lines had repudiated the new bill of lading for the purpose of gaining the favor of shippers. The inducement of largely increased business held out to these recalcitrant lines by disgruntled shippers was too strong to be lightly disregarded.

The first action taken in the way of amending the bill was to strike out the words "not negotiable." In doing this the committee recognized the chief cause of complaint, and knew that they were disposing of the most potent cause of the dissatisfaction. A great deal has been said and written regarding the mass of fine type crowded on the bill of lading, in which the railroad companies sought to evade their responsibilities as common carriers. From much of the discussion which has been evoked on this subject, it would be supposed that the railroad companies sought to make conditions which would subject shippers to such risk that they would find it advisable to insure all goods intrusted to the care of a railroad company. In reality, however, the only deep seated trouble with the new form was the words "not negotiable" stamped across the face of it. It can safely be presumed that many shippers would have been indifferent to the change of form had it not been for these two conspicuous words. They then examined the new bill for other objectionable features, and easily found them. It would be in-

teresting to know what percentage of the shippers ever read the old bill of lading until this discussion came up. Of course they read it if they had had claims to make against railroad companies for damages. It would then be forced on them. Few people read the conditions on telegraph blanks until they suffer loss or inconvenience through an operator's mistake, and it is the same way with a bill of lading.

It is claimed by Western shippers that the attempt to destroy the negotiable feature of bills of lading originated with exporters of large means who hoped thus to drive out the shippers with limited capital by preventing them from securing advances by the banks on their consignments. It would be difficult to prove that the railroad companies were really influenced in that way, although the effect of the new rule would be plainly as indicated. Now, however, the new bill will be as good collateral as the old one and the shippers generally are rejoicing over their victory.

One effect of the discussion of this matter was not foreseen by either of the parties in interest, but is likely to be of much importance. The terms of the bill of lading have been more carefully studied than ever before, and shippers now have a more intelligent idea of their relations with the railroad companies and the limitations which the latter are endeavoring to make as to their responsibilities as common carriers. The corrections in the new bill of lading will therefore hardly stop at the restoration of its negotiable feature. Although Chairman Blanchard asserts that the new bill of lading is more favorable to shippers than the old one, it is highly probable that it will not be regarded as sufficiently so, and strenuous efforts will be made to secure further concessions from the vanquished roads.

A Comparison of Prices.

The country press is endeavoring to convince farmers that their complaints about their poverty stricken condition are not well founded. Some of the Iowa papers have published quite convincing testimony on this point. The *News*, published at Galva, Henry County, Ill., has also made an original investigation which is very interesting. From market reports in its own files it collates the following comparison of local prices of farm products:

Products.	July 31, 1890.	July 30, 1889.
Butter.....	10¢ @ 12¢	10¢ @ 12½¢
Eggs.....	10¢	7¢
Ear corn.....	44¢	29¢
Shelled corn....	42¢	28¢
Oats.....	32¢	18¢ @ 24¢
Rye.....	46¢	50¢ @ 55¢
Hogs, per cwt....	\$3 @ \$3.30	\$4 @ \$4.50
Hay, per ton....	\$5	\$12

It would appear that in the section of country to which the above market prices apply the condition of the farmer has not sadly deteriorated in the past decade. He receives in 1890 as much for butter as in 1880, more for eggs, a great deal more for corn, more for oats, but less for rye, hogs and hay. The reduction in the price of hay is very heavy, but that is seldom a crop on which a Western farmer places

great reliance. After making this comparison of farm products, the *News* proceeds to make an investigation of the prices which farmers have to pay for the goods which they consume, applying for that purpose to Galva merchants for the charges actually made in their day books in the months of July and August, 1880 and 1890. In all cases articles of corresponding grade were compared. The following is the list compiled:

	1880.	1890.
Twine binder.....	\$300.00	\$100.00
Wier plow, 14-inch steel beam.....	18.00	15.00
Wier plow, 16-inch steel beam.....	21.00	17.00
Walking cultivators.....	25.00	16.00
Corn planter and checkrower.....	85.00	18.00
Mowers.....	90.00	45.00
Fence wire, per pound.....	.10	40.00
Good farm wagon, White or Mitchell.....	75.00	50.00
Bain wagon.....	85.00	50.00
Sulky plows.....	65.00	40.00
Wrought nails....	.08	.05
Wire nails.....	.07	.04
Common cut nails	.04	.04
Strap hinges, per pound.....	.30	.15
Wire cloth, per square foot.....	.05	.02½
Common 10d nails	.06	.03½
Paper of pins.....	.10	.05
Batting, per pound.....	\$0.15 to .20	\$0.10 to \$0.18
Prints.....	.06 to .10	.05 to .07
Shirting, per yard.....	.15 to .18	.07 to .12½
Muslin.....	.08 to .12	.06 to .10
Denims.....	.15 to .20	.12½ to .18
Ginghams.....	.10 to .12½	.08 to .12½
Crash.....	.15 to .25	.08 to .30
Paper needles.....	.08	.05
Linen thread.....	.12	.08½
Ingrain carpets, two-ply extra super.....	.96	.60
"A" sugar, per pound.....	.11 1-9	.06½
"C" sugar, per pound.....	.10	.06
Granulated sugar, per pound.....	.12½	.06½
Salt, per barrel...	1.40	1.10
Flour, per sack...	1.65	1.40
Flour, per sack...	1.85	1.55
Kirk's soap, per bar	.06½	.04 1-6
Can of corn.....	.30	.10
Coffee, per pound. {	.25	.25
Dried beef, per pound.....	.15	.12½
Codfish, per pound	.12	.07½
Mason fruit jars, 2 quart, per doz.	2.25	1.25
Uncolored Japan tea, per pound..	.50	.50

These figures show that if a farmer was at all able to make both ends meet in 1880, he is vastly better off in 1890. Instead of growing poorer, his condition has improved if he raises any crops. Everything he buys, except tea and coffee, is now lower in price than ten years since, while many articles are very much lower now than they were then. The farmer's lot is a hard one, it is true, and in no industry is there so much uncertainty as to its outcome, but it is an unfortunate thing for the country that demagogues are endeavoring to make him believe himself worse off than he really is. To meet their false arguments, such facts as the above are invaluable.

The northeast span of the Ohio connecting bridge at Pittsburgh was swung into position on Tuesday. The bridge will, when completed, be almost a mile long, and will have cost about \$1,280,000. About July 1 the work of raising the steel stringers to the top of the trestle work was

begun, and the span stood complete by August 9. The time since then has been spent in making ready for the swinging so successfully performed.

OBITUARY.

REUBEN MILLER, JR.

Reuben Miller, Jr., a pioneer merchant and manufacturer of Pittsburgh, died at his residence in Allegheny City on the night of the 18th inst. after a brief illness. Mr. Miller was 85 years of age and was born near Frankford, Philadelphia County, Pa., June 24, 1805, and at an early age came to Pittsburgh with the family. The father of the deceased engaged in the iron business. Young Reuben worked with his father until 1824, when he started in business for himself, the firm being known as R. Miller, Jr. & Co., conducting a produce store. About 1837 Mr. Miller built a foundry on the South Side, and in 1839 built the Valley Forge, the first iron boat that ever sailed the Western rivers. In 1855 Mr. Miller became a director of the Mechanics' Bank of Pittsburgh. He was for 17 years a member of the Monongahela Bridge Company, and for many years a director of the Chamber of Commerce. He was also a director in the Exchange and the First National banks. At the time of his death Mr. Miller was one of the managers of the Fidelity Title and Trust Company and the Western Insurance Company. He held several public positions during his life, having been a manager of the Western Pennsylvania Hospital, a school director and one of the managers of the Dixmont Hospital. For the past 20 years he was not actively engaged in business. Mr. Miller was married in 1826 to Miss Ann L. Harvey. The couple had seven children. Two daughters died while young, one son was drowned at the age of 15 years and another fell at the battle of Gettysburg. The three surviving sons are Wilson Miller, secretary of the Pittsburgh Locomotive Works, Reuben Miller, of the firm of Miller, Metcalf & Parkin, proprietors of the Crescent Steel Works, at Pittsburgh, and P. H. Miller.

The increased receipts of grain at the seaboard, including all the Atlantic ports, constitute a striking feature in our export trade during the last six months. Figures compiled from the books of the New York Produce Exchange show that the receipts have been of unusual magnitude. At New York the amount, counting flour at its equivalent in wheat, was nearly 65,000,000 bushels, which has never been exceeded excepting in the corresponding period in 1880. At Philadelphia and Baltimore the relative increase is still larger, these latter having more than doubled their total of the year preceding. The aggregate grain receipts at the four cities, New York, Boston, Baltimore and Philadelphia, in six months of 1890 are shown to have been 131,000,000 bushels, against 78,000,000 bushels in 1889 and 68,000,000 bushels over the year preceding. It is calculated that this increase is equivalent to 1,300,000 tons in favor of the transportation interests between Chicago and the seaboard, including lake and rail.

The peculiarities about the Indiana gas supply are that the producing area appears to be greater than that known in any other State, the supply seems to be larger and nearer permanent, and its development has added more wealth and population to Indiana than has accrued to all the other States from the same cause. It has been calculated that it saves at least \$5,000,000 a year to the people in fuel, and that it has added \$8,000,000 to the capital invested in manufacturing and given employment to 8000 operatives.

More Chicago Elevated Railway Schemes.

Manufacturers of structural material will be interested in the following details concerning a gigantic elevated railway scheme to be launched in Chicago:

Articles of incorporation were issued on the 16th inst. to the Chicago Elevated Terminal Railway Company. The capital stock is \$25,000,000, and Joseph T. Torrence, Joseph Donnersberger, Thomas W. Johnson, James J. Reynolds and Charles Eldred, all of Chicago, are named as incorporators. The three gentlemen last named are employed by General Torrence.

The line to be constructed, according to the articles of incorporation, will be an elevated road from some point on Twelfth street, east of the river, to a point on the Little Calumet River between Riverdale and Blue Island, with a branch from the main line at some point between Twenty-second and Thirty-first streets, running in a southwesterly direction into the town of Lyons. The route to be taken inside the city limits will be on Twelfth street and Blue Island avenue, and the road will make connections with surface roads outside the densely populated portion of the city. The promoters of the new enterprise are virtually the same parties who built the Chicago and Calumet Terminal Belt Road, lately sold to the Northern Pacific. The financial backers of the scheme are Kidder, Peabody & Co. and Baring Brothers, of New York and London, which firms are the principal owners of the Atchison, Topeka and Santa Fé. The object seems to be not only to provide an independent entrance into Chicago over elevated tracks for that company and other railroads seeking entrance into the city, but to utilize to the best advantage the property of the Atchison, Topeka and Santa Fé on State street, between Polk and Fourteenth streets. The scheme has been in contemplation for some time past, and it was the original intention to construct this new elevated road over the tracks of the new right of way of the Atchison, Topeka and Santa Fé into the city, thereby avoiding the necessity of obtaining a new franchise from the council. It is not certain now that that right of way can be used, because the Chicago, Madison and Northern (Illinois Central) has secured the same right of way jointly with the Atchison, Topeka and Santa Fé, and the former company, it is understood, are not in favor of having an elevated road over their tracks. If the opposition of the Chicago, Madison and Northern (Illinois Central) cannot be overcome the new Elevated Terminal Company will after all have to secure an independent right of way. It is understood that in the latter event the company will use the right of way of the Chicago Central (a paper road), which it has lately been claimed would be used by the Baltimore and Ohio to make connections with the Wisconsin Central.

The new elevated road, its promoters claim, is to be constructed in the most substantial manner, and is to have at least four and perhaps six tracks. The passenger depot is to be a most substantial and costly affair. It is to take in the two entire blocks between Twelfth and Fourteenth streets and State street and Third avenue. The principal entrance will be on Twelfth street, on a line with the new viaduct. The ground floors of the depot will be used for baggage rooms, &c., and south of Thirteenth street as freight houses. The Chicago and Grand Trunk owns at present the land on Third avenue up to the dividing alley between that and State street, and in order to get the use of all the land between Third avenue and State street for the new depot a deal is to be made between the Grand Trunk and Atchison, whereby the former is to take in

exchange the land between Twelfth and Taylor streets on Third avenue upon which to erect its freight houses. As this land is more valuable than that which the Grand Trunk now owns, it is believed the latter will make the exchange.

Among the roads mentioned as being anxious to avail themselves of the opportunity to come into the city by the new elevated terminal are: The Atchison, Topeka and Santa Fé, the Baltimore and Ohio, the Canadian Pacific, the Chicago, St. Paul and Kansas City, the Big Four (Kankakee Line), the Michigan Central.

The Baltimore and Ohio, it is stated, has not yet completed its deal with the Northern Pacific for using the Central Depot on Fifth avenue and Harrison street. If it can make arrangements with the Elevated Terminal it will not only obviate the necessity of building a new line from Blue Island to a connection with the Northern Pacific, but will secure a route several miles shorter. This, of course, would not interfere with the arrangement made between the Northern Pacific and the Baltimore and Ohio so far as the use of the Calumet Terminal from South Chicago to Blue Island or the crossing of the Santa Fé is concerned, as that portion of the Calumet Terminal, or as it is now known, the Northern Pacific Terminal, will have to be used by the Baltimore and Ohio. The Michigan Central and Big Four, it is said, have become disgusted with the policy thus far pursued by the Illinois Central as regards the construction of a depot on the Lake Front, and if they can make reasonable arrangements with the new company will bid the Illinois Central "good-by."

Joseph T. Torrence is now in New York, but Mr. Donnersberger stated that terminal facilities would be offered to any road wishing to enter Chicago.

The Alton has also under advisement a scheme for building elevated tracks over its present lines inside the city limits.

A Natural Gas Phenomenon in Indiana.

Much excitement prevails in the vicinity of Shelbyville, Ind., over an explosion of natural gas last week. A heap of logs had been ignited to get them out of the way, which set fire to gas escaping through the ground in the vicinity, and the result was a miniature volcanic eruption, which tore up 10 acres of ground. A press dispatch from Shelbyville, dated August 14, says:

Much excitement still prevails over the recent gas explosion. It is now discovered that the whole neighborhood in the vicinity of the young volcano is saturated with natural gas and the soil is full of it. One can run a crowbar down in the ground any place and then light the gas which proceeds from the soil in various quantities. This would indicate that the gas from the gas wells has found its way below the limestone, and in many places fractures in the stone permit it to escape into the sand and gravel immediately below the surface soil, which partially prevents its escape into the air. This bears out the theory that gas has been for some time escaping from the sides of the gas wells and diffusing itself in the sand and gravel below the limestone.

In Van Buren township, about 4 miles north of the late eruption, the water wells which have been sunk 20 to 30 feet, a few feet below the surface stone, have become saturated with gas from the wells 3 miles away and the people have abandoned the use of the water, cased the wells and are now using the gas for fuel.

The whole township seems to be filled with the combustible, and the inhabitants are threatened with disaster. It is altogether probable that the diffusion of gas

in the soil more or less affects the growing crops. The great question may yet be as to the advisability of sinking gas wells, or if sunk at all, whether other methods could not be used to case and confine the explosive. Pockets for gas are no doubt forming beneath the limestone all over the region of the gas belt. It is yet a question as to which is the most hazardous, the accumulation of gas in pockets followed by eruptions, similar to the Waldron blowout, or permitting it to permeate the soil, as it is now doing in Van Buren and Noble townships, poisoning the water and diseasing the air. The fissures of the ground blown to atoms Monday are now filling with water, through which gas occasionally forces its way.

PROVIDENCE NOTES.

William Barrett, employed by the Corliss Engine Company, has started for Chili and Bolivia, South America. He goes to set up some of the company's engines, and will be gone a year or more.

One point of interest of the United States steamship Baltimore is the mammoth windlass, which was built specially for this vessel by the American Ship Windlass Company, of this city. The statement that it will hoist all four anchors and chains at once at the rate of 7 fathoms per minute is invariably doubted, but it is nevertheless true. The apparatus is capable of lifting 280,000 pounds. It is supposed to be in advance of any windlass in the English navy in manipulating anchors.

The stock and fixtures of the Providence Steam Heating Company, of this city, will be sold at public auction at assignee's sale on Thursday, August 21, at 10 o'clock.

The Herreshoff tubular boiler, devised and developed by the well known firm of engineers and boat builders, of Bristol, consists of a number of vertical elements, each composed of horizontal tubes, with right and left hand threads and connected by return bends. Two adjacent elements are connected at the back and lower ends by short vertical tubes to a Y-piece, which has a short connection to a mud drum situated below the grate bars. At the upper ends the same elements are similarly connected to a steam drum, situated just in front of the boiler casing. At each side of the grate there is an element having a connection to the steam drum and another to the feed water pipe near the mud drum. These side elements and the vertical connecting pipe to the mud drum serve like water legs to protect the boiler casing from the intense heat of the fire. Above the boiler proper and entirely within the casing there are three horizontal elements, forming a practically continuous pipe, the tubes of which are connected to each other, as in the vertical elements. These elements serve as a feed water heater, and also protect the top of the casing by reducing the temperature of the gases of combustion. In front and at the upper part of the boiler is the centrifugal separator, from the top of which the main steam pipe leads to the engine, and at about the middle of which the steam drum is connected. The upper element of the feed water heater receives the main feed pipe, the lower element being connected to the bottom of the separator. All the tubes of this boiler and the feed water heater are of iron, and are separately tested before they are put in the boiler to a pressure of 1000 pounds per square inch. The U-connections are of malleable cast iron carefully selected. The circulation is as follows: The feed water enters the upper horizontal element; forced through these elements by the feed pump, it enters the bottom of the separator, and from there, by means of two downcast pipes attached to the sides of the former near the bottom, it passes to the lower water chamber or mud drum at the back of the boiler, this mud drum supplying in turn the several vertical elements, which finally discharge into the side of the drum, and thence the steam, together with any intermixed water, passes into the centrifugal separator, to the top of which the steam pipe is attached. The lower side elements draw their supply from the connecting pipes between the downcasts and mud drum, and discharge into the bottom of the steam drum, there meeting the discharge from the vertical elements. This design of boiler looks toward a complete, or nearly complete, conversion of the water into steam before it reaches the steam drum. The object of this latter design is to produce a boiler which will not require as close attention to the feed supply as did the original Herreshoff coil boiler. The advantages claimed for a tubulous boiler

are that it is capable of working at as high pressure as can be utilized by the steam engine, while the danger of explosion is greatly reduced. It is lighter than other types, the water in the water tube boiler averaging from 5 to 15 per cent. of the weight of the empty boiler, while in the Scotch boiler the average is from 60 to 65 per cent. With a large and effective heating service and a small bulk of water, steam is rapidly generated. The parts are small and light; duplicates can be carried and repairs be rapidly made. The principal requisites of a tubulous boiler are a free and natural circulation, a positive feed supply, pure water and care.

LEONIDAS.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., August 19, 1890.

The majority in the Senate are in a worse quandary over their differences on the Election bill and limiting debate in order to facilitate tariff consideration and action than the minority had any reason to expect when they set out to prevent the passage of the former by dilatory amendment and speeches on the latter. The resolution introduced by Senator Quay to begin to vote on the Tariff bill on next Saturday a week and fixing an order of business for the rest of the session to the exclusion of the Election bill, only served to intensify the discord and put the final passage of the Tariff bill off until a still later date.

The discussion on tin plate has taken a wide range. The Spooner resolution, making that manufacture free after 1896 if the American article aggregates one-third the importations in any one of those years, reconciles the Western sentiment to the increased rate of duty.

The minority propose also to give steel rails a prolonged term of debate. The majority have been waiting for additional data from the Commissioner of Labor. The recent report giving the cost of producing a ton of steel rails in the United States, and placing the expenditures for direct labor at \$11.59 a ton, has aroused considerable feeling among those in favor of a higher rate. Several papers have been filed to disprove the conclusions of the commissioners. There is no doubt that the minority have derived much rhetorical raw material from the estimates and approximations in the commissioner's report. Such Western Senators as Davis, Plumb, Ingalls and others are ready to jump at such data, being ignorant of the actual facts in the premises.

There is danger that the rate on steel rails will be forced even lower than the Senate rate of \$11.20. The representatives of the steel rail interests are on the ground and will watch every turn. The progress on the tariff has been unusually slow and tedious during the past week. The River and Harbor bill consumed several days. Now there is a prospect of further delay, occasioned by speeches on the Election bill drawn out by the Quay resolution sacrificing that measure to the Tariff bill.

The Secretary of the Treasury, in conversation, calls attention to the enormous increase of the receipts on imports during the past 30 days—frequently over \$1,000,000 a day. He explains this as in anticipation of the passage of the Tariff bill and the desire of the foreign manufacturers to get their products in the American market before the new measure goes into effect. It is said in Treasury circles that reports from industrial centers complain of the effect of the presence of these inferior foreign articles and regard the fall trade as seriously crippled already, owing to the delay in passing the bill in the Senate. There is no doubt that some method by which the Tariff bill may be

disposed of promptly would be of great advantage to home industries.

It is the belief among the leaders in the House that it will take several weeks if not longer before the conferees of the two branches can come together on the differing provisions of many parts of the bill after its passage in the Senate. The members of the Ways and Means Committee will be compelled to be very stiff, as they are in a peculiar position, having compiled their bill in conformity with the views of the representatives of the industries involved. They are therefore committed, while the Senate amendments have been largely framed on general principles and then not always in conformity with the interests of ample protection.

A movement in the House not to act finally on the Tariff bill until the Election bill shall have been passed in the Senate does not tend to lessen the difficulties of the situation. The manufacturers in all parts of the country are urging the passage of the Tariff bill at the earliest moment as of vital importance to the industrial interests of the North.

Senator Edmunds has led off in the reciprocity movement in connection with the trade of the Spanish-American governments. He will make a great speech on the subject, presenting this advanced doctrine under the American protective policy in a comprehensive light. When this question is taken up further delay may be expected in the tedious way of the tariff, as every prominent Senator wishes to acquit himself of a speech for political effect.

The Secretary of the Treasury has ruled against an appeal from an assessment of duty at 45 per cent. *ad valorem* on parts of metallic bedsteads, the appellants claiming them to be dutiable at the rate of 30 per cent. as parts of furniture. The Secretary, in supporting the 45 per cent. rate, says that the merchandise in question, consisting of pieces of brass castings, brass and iron tubes, and spun brass knobs, all of which were partially manufactured and intended for use in the manufacture of metallic bedsteads, having been reported for duty as manufactures of metal, not otherwise provided for, the Department is of opinion that the articles referred to are not "furniture in pieces or rough and not finished," and cannot be recognized as such in the condition in which imported. They are, therefore, properly dutiable as manufactures, articles or wares composed of metal not otherwise provided for.

PERSONALS.

Henry H. H. Suplee has severed his connection with *Mechanics* as its editor to accept a position with the Yale & Towne Mfg. Company, of Stamford, Conn.

Robert Williams, who has occupied the position of manager of the plant of the Carbon Iron Company, at Pittsburgh, for a number of years, has resigned to accept a position in one of the Eastern cities.

J. V. Umberger, formerly of Philadelphia, is now general manager of the Ingalls Iron and Coal Company, of Waynesboro, Va.

Philip W. Moen, of the Washburn & Moen Mfg. Company, has returned from Europe.

W. R. Stirling, of the Illinois Steel Company, is expected back from a trip abroad at an early date.

The statistician of the Interstate Commerce Commission, Henry C. Adams, has just completed his second annual report to the commission. The report covers the operation of 609 roads and 153,

385.37 miles of line. It shows that the railway property of the United States is controlled by 1705 organizations. Of the 645 subsidiary roads making report to the commission, 482 may be properly classed as subordinate roads. This accounts for 1081 of the total. Of the number unaccounted for, 148 are roads owned by private individuals, the others being small lines, feeders to great systems. The gross earnings for the year, exclusive of rental of tracks, yards and terminals, were \$964,816,129, or \$6290 per mile of line, and the operating expenses, exclusive of rentals of tracks, yards and terminals, \$644,706,701, or \$4203 per mile of line. This leaves a net income from operations of \$320,109,428, or \$2087 per mile of line. After deductions are made for fixed charges, the final net income for all the roads in the United States was \$101,383,736, or \$651 per mile of line. Out of this sum dividends have been paid to the amount of \$82,110,198, or \$535 per mile of line, which leaves a surplus from operations of the year of \$19,278,538, or \$126 per mile of line. The total amount of stocks is shown to be \$4,251,190,718, of which \$847,740,399 are owned by railway corporations. The total amount of bonds is \$4,267,527,859, of which \$304,232,502 are owned by railway corporations. From this it appears that the total stocks and bonds representing railway property in the hands of the public is \$7,366,745,677. The report further shows that the passenger earnings have increased from 30.46 per cent. of total earnings in 1888 to 31.10 per cent. in 1889; while freight earnings have decreased from 67.35 per cent. in 1888 to 66.82 per cent. in 1889.

VIRGINIA IRON NOTES.

The Ingalls Iron and Coal Company, at Waynesboro, are preparing to open iron mines on their property, after which this company propose to erect two furnaces, a rolling mill, steel plant and pipe foundry. At the company's coal mines in West Virginia 1000 coke ovens are to be built. Waynesboro is adjacent to Basic City, and the two places promise to eventually become one of the largest and most important iron manufacturing cities in Virginia.

Mackintosh, Hemphill & Co., Pittsburgh, are constructing for the Radford Crane Iron Company, of Radford, three blowing engines for the new blast furnace in progress of erection at that place. The steam cylinders are 42 x 60 inches, and the air cylinders are 84 x 60 inches.

The Stanly Land and Improvement Company have been formed at Stanly to erect an iron furnace, a spiegel furnace and a rolling mill. The company have a capital stock of \$2,000,000 and own 5000 acres of mineral land, on which mines are to be opened at once.

A. E. & D. J. Huddleston, of Greenbrier County, W. Va., are reported to have bought about 1000 acres of ore land in the vicinity of Covington and announce their intention of forming a company to put the property under development. Their company will establish several iron industries.

Iron ore properties near Front Royal are being developed. At Fisherville C. P. Young is opening an iron mine, and at Pearlsburg D. W. Mason is developing the Johnston iron mines.

The Virginia Furnace Company, at Roanoke, have doubled their capital stock recently.

E. Burd Grubb, of New Jersey, is the president of the Lynchburg Iron Company, recently reorganized under a new charter. The furnace of this company is now undergoing extensive improvements.

The plans for the new furnace and rolling mill to be established at Shenandoah, by the Shenandoah Furnace Company, are about ready to put into execution, and work is expected to begin in a few days.

The Cardwell Machine Company, of Richmond, manufacturers of agricultural implements and other machinery, are enjoying a season of unusual activity just now. They have very recently booked orders for cotton seed oil machinery from Boston, Ga., Newberry & Matthews, in South Carolina, and other points in the South. Besides this they have on their books contracts for hydraulic cotton press machinery to go to Bombay,

India, and Moscow, Russia. They recently shipped some machinery to Calcutta. This is only one instance where a Southern manufacturing establishment is building up a large foreign trade.

Two thousand acres of mineral land near Collierstown has been optioned by the Virginia Development Company, of Roanoke.

Protected Cruiser No. 12.

Proposals have been invited by the Navy Department for the construction of a protected cruiser of about 7300 tons displacement. Bids will be received under either of two classes:

Class 1.—For the construction of the hull and machinery, including engines, boilers and appurtenances, complete in all respects in accordance with the plans and specifications provided by the Secretary of the Navy.

Class 2.—For the construction of the hull and machinery, including engines, boilers and appurtenances, complete in all respects in accordance with the plans and specifications provided by the bidder.

All parts must be of domestic manufacture. The builder must guarantee a speed of 21 knots per hour in the open sea, maintained for four consecutive hours, during which time the air pressure in the fire rooms must not exceed 1 inch of water. A bonus of \$50,000 will be paid for each quarter knot over the guarantee, and for each quarter of a knot below 21 the builder will forfeit \$25,000.

The department plans call for a vessel 400 feet long on the mean load line; beam, molded, 58 feet; draft, mean normal, 23 feet; extreme normal, 24 feet; displacement, normal, about 7300 tons; speed sustained, 21 knots, and indicated horse power, 20,500. The main battery consists of four 6-inch breech-loading rifles, rapid firing, about 18 machine guns and six torpedo tubes.

The arrangement of the motive power will be somewhat novel, as the force will be transmitted through three screws, one placed amidships, as in ordinary single screw vessels, and two others placed further forward, one on each side, as is usual in twin screw vessels. This arrangement is not entirely new, having been adopted by the French for some of their later vessels, but it represents the latest advance in the steam engineering line where such great power is to be transmitted. If twin screws were used over 10,000 indicated horse-power would pass through one shaft; now each shaft transmits only 6850, and the vessel has one more chance in case of break down.

The machinery and boilers were designed by Engineer in Chief George W. Melville, U. S. N., chief of the Bureau of Steam Engineering. There are three sets of triple expansion vertical inverted cylinder engines, driving the triple screws. The center screw is about 4 feet 6 inches below the other two. Each engine is placed in a water tight compartment, and is complete in every respect, so that the vessel may be propelled at a slow speed by the center screw alone, by the two outer screws at a medium speed and by the three screws when the highest rate of speed is required. Each shaft is fitted with a disengaging coupling, so that when not in use the propellers are free to revolve. The great advantage of this arrangement is that it allows the machinery to be worked at its maximum and most economical number of revolutions at all rates of the vessel's speed, and each engine can always be used for propelling the vessel, an advantage of great importance, and one that the arrangement of two sets of engines working on the same screw does not possess. The steam pressure is 160 pounds.

The cylinders are 42, 59 and 92 inches and the stroke 42 inches.

The shafting is made of forged steel 16.5 inches in diameter, with an axial hole 7.5

inches in diameter. Steel has been used wherever possible, so as to make the machinery as light as is consistent with safety. The total capacity of the circulating pumps per minute, when used for bilge purposes, is 40,500 gallons. The total indicated horse-power at 129 revolutions per minute and a forced draft of 1 inch of water is 21,000 horses.

There are eight main double ended boilers, placed in four water tight compartments, and two single ended auxiliary boilers placed on the berth deck. The air tight fire room system of forced draft is used. Six of the double ended boilers are 15 feet 6 inches in diameter and 21 feet 6 inches long, each having eight furnaces and 175.5 square feet of grate surface and 5932.4 feet of heating surface.

Two of the double-ended boilers are 11 feet 8 inches in diameter and 18 feet 8.5 inches long, each having four furnaces and 84 square feet of grate surface and 2870 square feet of heating surface. The total grate surface for the main boilers is 1221 square feet; the total heating surface for the main boilers is 41,334.4 square feet. Each auxiliary boiler is 10 feet in diameter, and 8 feet 6 inches long, with two furnaces, and has 32 square feet of grate surface and 968.5 square feet of heating surface. The total grate surface for the auxiliary boilers is 64 square feet; the total heating surface for the auxiliary boilers is 1937 square feet. All the boilers are constructed of steel for a working pressure of 160 pounds.

The vital portions of the vessel are protected by an armored deck 4 inches thick on slopes and 2½ inches on the flat. The space between this deck and the gun deck will be minutely subdivided by coal bunkers and storerooms. In addition to these a coffer dam 5 feet in width will be worked next to the ship's side for the whole length of the vessel. In the bunkers this will be filled with patent fuel, forming a wall 5 feet thick against machine gun fire. The contents can also be utilized as fuel in an emergency. Forward and abaft the coal bunkers the coffer dam will be filled with some water-excluding substance similar to "woodite." In the wake of the 4-inch and machine guns the ship's side will be armored with 4 and 2 inch plates. The 6-inch guns are mounted in the open, protected by heavy shields attached to the gun carriages.

The accommodations for officers and crew are spacious, well ventilated and lighted. All the most approved modern appliances for exhausting vitiated air and for incandescent lighting by electricity have been incorporated in the design. The coal capacity is very large, 2000 tons. At 10 knots speed per hour this will give the vessel an endurance of 109 days or a radius of action of 26,240 knots, or, in other words, she will be able to steam around the world in 109 days without recaling.

In appearance the vessel resembles closely an ordinary merchantman, the sides being nearly clear of projections or sponsons which ordinarily appear on vessels of war. She will have two signal masts, which will have no military tops on them, however. The function of the vessel is to destroy the commerce of an enemy; therefore her general appearance is such as to enable her to get within range before her character is discovered. As a whole, this vessel will represent the latest idea of a powerful, economical, protected commerce destroyer. The hull will be of steel. The vitals of the ship will be well protected, and the gun stations shielded against machine guns. The subdivision of the hull is such as to form a double hull below the water and offer as great security against damage from torpedo attack as can be given in a vessel of this class.

TRADE REPORT.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,
PHILADELPHIA, Pa., August 19, 1890.

Pig Iron.—The market remains in very much the same condition as noted for some weeks past. There is a large consumption, but the supply appears to be so liberal that while buyers persist in the hand-to-mouth policy it will be impossible to get up any improvement in prices. For the present, therefore, sellers are quite satisfied to market their product at current rates, which has not been found practicable in all cases. As a rule, \$18 @ \$18.25, delivered, is quoted for No. 1 Foundry, \$16.50 @ \$17 for No. 2 and \$15.25 @ \$15.50 for Gray Forge, and the majority of recent sales have been made on this basis, although some brands have been shaded a trifle to secure good sized orders, particularly in the lower grades. On the whole, the indications are not favorable for anything beyond a continuance of current quotations, and with very little increased pressure from outside sources it would not be easy to avoid more or less of a reduction from even the present very low quotations. One or two lots of Southern Iron have been offered somewhat urgently at \$15, delivered, for No. 2 plain, but buyers of this class of Iron are not bidding more than \$14 @ \$14.50, with some probability of their offers being accepted. The demand for finished products is the most encouraging feature in sight, but the supply of Pig Metal is a little out of proportion, so that without some increase in the demand, speculative or consumptive, it is hard to see any reason for expecting better prices for Pig Iron than those now ruling. The trade seem to be acting on this idea, hence it is that sales are either in small lots for immediate delivery or in larger lots at such concessions as buyers insist upon, before taking lots of 1000 up to 5000 tons each. Sales of this character are exceptional, of course, but if realizations must be made, they are necessarily very much on buyers' own terms.

Bessemer Pig.—There is more pressure to sell, and on any reasonable chance for a good sized order liberal concessions would be made. Nominal prices are about \$19, at furnace, but buyers seem disposed to wait until the last minute before renewing their contracts. For the present the output is promptly taken on old orders, and as there is no falling off in consumption, it is presumed that new business will have to be placed by the time that sellers are ready to make deliveries. Be that as it may, sellers are anxious for business, and to secure it would name lower prices than have been mentioned for some time past.

Spiegeleisen.—Nothing doing of any importance. Sellers quote \$31 @ \$32, duty paid, but buyers show very little interest in the market, and mention \$30 as their ideas of value. A 2000 ton lot at \$30, duty paid, Baltimore, was secured a few days ago by one of the Western mills.

Steel Rails.—There is an improved demand for Rails, and while only a moderate amount of orders has been taken, inquiries denote greater activity in the near future. There are three orders to be placed which will aggregate 80,000 to 100,000 tons, and it is believed that contracts for these will be closed within the next two or three weeks. The call for small lots is maintained, so that mills are fully employed, with some prospect of crowding, to meet all demands during the next couple of months. Prices are un-

changed, but firm, at \$31.50 @ \$32, at mills, with a fair probability of better figures in view of the increased demand.

Steel Billets.—The market is a little irregular, and on firm offers for round lots it is thought that some concessions would be made. Sellers quote \$33 @ \$33.50, delivered, and it is not known that business has been done below these figures, simply because there are no bids for large lots, unless at prices so far down that manufacturers refuse to consider them. The mills are running off their contracts quite rapidly, however, and some of them are inclined to encourage sales at moderate concessions from quoted rates.

Crop Ends.—There is a very considerable inquiry for Crops, and sales of about 1500 tons are reported at something over \$23, duty paid. Sellers now quote an advance on this figure, some asking \$25 for Crops low in phosphorus, but it is not improbable that \$23.50 @ \$24 would be accepted for favorable deliveries.

Muck Bars.—The demand is not large, but there are so few Bars for sale that sellers control the market, and refuse to consider anything at less than \$30, at mill, or \$30.50 @ \$30.75, delivered.

Bar Iron.—The demand continues well up to the capacity of the mills, so that prices are firm, with an advancing tendency. Quite a number of orders have been placed by car builders, who are said to have paid about 1.85¢, delivered, which, with a good general demand, has placed manufacturers in a comparatively easy position. On the general run of business 1.85¢ @ 1.90¢ is now quoted, the feeling along the entire line being one of great firmness.

Skelp Iron.—A very active demand is reported, but owing to the crowded condition of the mills there has been no great amount of new business taken. One lot of 1000 tons Grooved was taken at 1.85¢, delivered, and smaller lots at 1.87½¢ @ 1.90¢, the last named figure now being the usual asking price. Sheared Skelp has sold at from 2.20¢ to 2.25¢, delivered, but the latter figure is considered somewhat extreme, and is only paid for special deliveries.

Plates.—The demand is fully maintained, and in all directions mills are crowded with work. Prices are firm, and in some cases a further advance is demanded, but as a rule sellers are willing to accept last week's prices for favorable deliveries. The outlook is unusually favorable for the selling interests, and continued activity is pretty well assured for the next two or three months.

	Iron.	Steel.
Ship Plates....	2.25 @ 2.30¢	2.30 @ 2.40¢
Tank.....	2.25 @ 2.30¢	2.40 @ 2.50¢
Bridge Plate....	2.30 @ 2.35¢	2.50 @ 2.60¢
Shell.....	2.40 @ 2.50¢	2.60 @ 2.70¢
Flange.....	3.00 @ 3.10¢	2.80 @ 3.00¢
Fire-Box.....	3.75¢	3.75 @ 4.25¢

Structural Material.—The demand continues equal to the capacity for production, and as there is a great deal of work on hand, manufacturers feel inclined to stiffen prices on all new business. There is no quotable advance, but outside figures are now pretty generally realized. One or two large orders have been placed for bridge and viaduct work, but the demand is chiefly for small lots and from all classes of consumers, with indications of its continuing indefinitely. Prices for lots delivered in consumers' yards are about as follows: 2.30¢ @ 2.40¢ for Sheared Plates; 2.20¢ @ 2.25¢ for Angles, with 10¢ @ 25¢ more for the same in Steel; Tees, 2.7¢ @ 2.8¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Old Rails.—There is a renewal of inquiry for large lots, with \$25, duty paid, bid for prompt shipments of 1000 ton lots to this port. Sellers quote \$25.50 @ \$26, with some prospects of business being done at about the inside figure. Lots in the in-

terior are firmly held at \$26 and upward, and as the supply is small the offerings are pretty well taken.

Sheet Iron.—The demand is so large that manufacturers find great difficulty in making deliveries as required. Prices are firmly maintained, and for carload lots of best makes are about as follows:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.20¢ @ 3.30¢
Best Refined, Nos. 25 to 26.....	3.40¢ @ 3.50¢
Best Refined, No. 27.....	3.50¢ @ 3.60¢
Best Refined, No. 28.....	3.60¢ @ 3.70¢
Common, ½¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3.1¢ @ 3.2¢
Best Soft Steel, Nos. 21 to 24.....	3.3¢ @ 3.4¢
Best Soft Steel, Nos. 25 to 26.....	3.5¢ @ 3.6¢
Best Soft Steel, No. 27.....	3.7¢ @ 3.8¢
Best Soft Steel, No. 28.....	3.8¢ @ 3.9¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	

Best Bloom, Galvanized, discount, .60 @ 62½¢
Common, discount..... 62½¢ @ 67½¢

Scrap Iron.—There is a good demand and prices are firm, but it has not been found practicable to secure any advance on prices recently ruling, which are about as follows: No. 1 Wrought, \$22 @ \$22.50, Philadelphia, or for deliveries at mills in the interior, \$22.50 @ \$23.50; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$15.50 @ \$16.50 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, \$26 @ \$28 for Old Fish Plates, and \$17 @ \$18 for Old Car Wheels.

Wrought Iron Pipe.—The developments of the past week show a more urgent demand, with indications of little or no abatement for some months to come. Meanwhile discounts are firm as follows: Butt-Welded Black, 47½¢; Butt-Welded Galvanized, 40¢; Lap-Welded Galvanized, 47½¢; Lap-Welded Black, 60¢; Boiler Tubes, 1½ inches and smaller, 45¢; Boiler Tubes, 2 to 4 inches, 50¢; Boiler Tubes, 4½ inches and larger, 52½¢; Oil Well Casing, 50¢.

Cleveland.

CLEVELAND, August 18, 1890.

Iron Ore.—Buyers still have all the best of the situation. They have contracted for about 100,000 tons of non-Bessemer during the past week at \$4 @ \$4.25, f.o.b. cars lower lake ports. The rates of transportation from the head of Lake Superior have again been reduced 10¢ per ton. It is probable that not over 500,000 tons of non-Bessemer remain unsold. There is but little if any change in the Bessemer Ore market. Only a small quantity of this grade of Ore remains unsold, and it is not at all certain that prices will be altered in any way. Nearly 75,000 tons of Ore were unloaded on the local docks during the past week. During the same period about 35,000 tons were sent forward to the furnaces.

Pig Iron.—The market is featureless. Some buying is being done, but the quantities taken are invariably small, and the prices paid are about the same as have been quoted in these columns during the past four weeks. Confidence in the future of the market is more firm, if possible, than ever before. The consumption of Iron is reported to be larger than for some time past. Sales of Bessemer at \$19 are reported, and Mill Iron is in some demand at \$15.80. Quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	\$20.00 @ \$21.00
Nos. 1, 2 and 3 Bessemer, per ton..	19.00 @ 19.30
No. 1 Strong Foundry, per ton..	17.80 @ 18.30
No. 2 Strong Foundry, per ton..	16.80 @ 17.30
No. 1 American Scotch, per ton..	17.80 @ 18.30
No. 2 American Scotch, per ton..	16.80 @ 17.30
No. 1 Soft Silvery, per ton.....	17.50 @ 18.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton....	15.30 @ 15.80
Mahoning and Shenango Valley Red Short Mills, per ton.....	15.80 @ 16.30

Scrap.—A fairly good trade is reported at prices varying but slightly from those prevailing during the past few weeks. Selected Car Axles are worth \$27; No. 1 Wrought is quoted at \$21; Wrought.

Turnings at \$15.50; Machinery Scrap at \$14.50, and Cast Scrap at \$13.

Old Rails.—The market is quiet, about \$26.50 being paid for Old American Rails.

Manufactured Iron.—There is a slightly improved demand for Common Bar at 1.75¢ from the mills.

(See telegram page 307.)

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts.,
CINCINNATI, August 18, 1890.

Pig Iron.—A few days of demoralization, low prices and some sales have been succeeded by a firmer feeling, but few large orders. The latter part of the week has been very quiet, although the aggregate sales are about 10,000 tons, made up mainly of lots ranging from 100 to 300 tons, and carload lots. The bearish influences of last week have been ephemeral in nature, some of the reports having been found groundless, or at least of less significance than was generally supposed. Regarding the corn crop, while the situation is bad enough, there may have been some exaggeration emanating from speculative sources; a large part of the shortage this year will be made up from the surplus grain of last year's yield. While Western railroads will not be likely to move as much corn this year, nevertheless they anticipate a large, if not increased, tonnage from other sources, according to information received from the management of several important Western transportation companies, who have considered the outlook bright enough to authorize the placing of orders for new freight cars. Reports of the continued heavy melting of iron all over the country are most gratifying to the furnaces, as well as to the mills, foundries, shops and works of various kinds. But active and sharp competition is an element not to be ignored and has much to do with the shaping of prices. The melters of Pig each day learn better how to manage their mixtures by which they are enabled to introduce a larger proportion of low priced iron, and thus either derive the advantage from a monetary view or succeed in securing larger and more frequent orders. During the month of July it is observed that while there has been an accumulation of Coke Iron in the North and East there has been a reduction of about 15,000 tons in the South. The stocks of Charcoal Iron were increased about 3500 tons. The increase of Coke Iron was largely in the Shenango Valley region, where the increase in the cost of fuel, ore and labor, together with the idleness of the mills in the district during the summer, contributed to make sales either impossible or unprofitable. And now, since the reduction of freight rates from the South to that section inaugurated August 1, the way has been opened for the entrance of Southern iron to that territory. Some little "warrant" iron has been sold here recently at a shade under prices current for furnace iron. Sales have been mainly of No. 3 Foundry and Gray Forge Coking, but there has also been more movement of Charcoal Iron. The demand is mainly for fall delivery, but some sales have been made embracing January and February of next year. The following are the approximate prices current here, cash, f. o. b. cars:

Foundry.

Southern Coke, No. 1	\$15.25 @ \$15.75
Southern Coke, No. 2	14.75 @ 15.00
Southern Coke, No. 3	13.75 @ 14.00
Ohio Soft Stone Coal, No. 1	17.00 @ 17.50
Ohio Soft Stone Coal, No. 2	16.00 @ 16.50
Mahoning and Shenango Valley	17.50 @ 18.00
Hanging Rock Charcoal, No. 1	21.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.50 @ 20.50
Tennessee and Alabama Charcoal, No. 1	18.00 @ 19.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.50

Forge.	
Gray Forge	13.50 @ 13.75
Mottled Neutral Coke	13.00 @ 13.25
Car Wheel and Malleable Irons.	
Southern Car Wheel	22.50 @ 23.25
Hanging Rock, Cold Blast	22.00 @ 22.50
Lake Superior Car Wheel and Malleable	21.00 @ 22.00

Rogers, Brown & Co. have been appointed agents for the Vanderbilt Furnace in the West and South. The furnace will blow in August 20.

The DeBardeleben Company expect to blow in three new stacks about September 1.

Detroit.

WILLIAM F. JARVIS & Co., under date of August 18, 1890, say: While there is a continued activity in the Pig Iron market, prices, with the exception of a sharp advance in Jackson County Silvers, show no change from our last report. The demand for prompt delivery is most noticeable, and it would seem as if Southern furnaces, in particular, had contracted for August and September delivery rather more Pig Iron than they could actually deliver. The curtailment in the production, however, is largely accountable for this. Jackson County Silvery Irons are becoming scarcer all the time, and an advance of 50¢ per ton was made general only to day. Malleable Iron manufacturers are again forced into the market for Lake Superior Charcoal to a certain extent, and in consequence a number of inquiries are being figured upon at the present time. We quote the market firm at the following figures:

Lake Superior Charcoal, all numbers	\$20.50 @ \$21.00
Lake Superior Coke, Bessemer	20.00 @ 20.50
Katabdin (Maine Charcoal)	24.00 @ 25.00
Lake Superior Coke Foundry, all ore	19.25 @ 20.75
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.25 @ 15.50
Jackson County (Ohio) Silvery	19.00 @ 19.50

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts.,
CHATTANOOGA, August 18, 1890.

Pig Iron.—Pig Iron is fully holding its own in price. In a recent trip of your correspondent to the Birmingham district he ascertained that there is very little stock on hand, and No. 1 is especially hard to get. It can hardly be said that prices are any higher, but it is certainly a fact that prices are very firm, and the inquiries coming in indicate that sales will be good for the next two or three months. To give any information as to what section of the country inquiries are most frequently received from would be almost impossible. They come from every direction in the United States, and from Canada. The demand appears to be now more for Foundry Irons than for any other. The question of transportation for Pig Iron from the South to Northern States is now giving shippers much concern. The cotton crop being about to commence, together with the immense amount of lumber to be shipped out, will no doubt very much embarrass the shipment of Pig Iron. All the railroads have done all they possibly could to increase their rolling stock, both engines and cars, but so far with but little relief. Taking the cotton, lumber and Pig Iron into account the freights have increased beyond what the railroad companies have prepared for. In shipments of the three articles mentioned above the Southern States will put into the Northern markets this year probably one-third to one half more value in dollars and cents than they have ever done before. Some of the furnaces are asking \$13 for No. 1 at the furnace and \$12 @ \$12.50 for No. 2.

Louisville.

LOUISVILLE, KY., August 18, 1890.

There has been a fair amount of buying, but sales have not been as large as was hoped for, though it is thought the coming week will show the placing of large orders.

The prices remain the same as during the previous week, buyers finding that the views of leading furnaces are stiff, and for fall deliveries it is believed that consumption is sufficiently large to hold present prices.

Manufacturers of Iron report more work than they can take care of, and that a large amount is being turned away. Prices with them are higher than at any time this year, and they do not understand why Pig Iron does not advance in sympathy with them. The most encouraging feature of the market is the condition of consumers; they are not crowded with work, but orders are being turned down. Unless furnace capacity has been increased very much out of proportion to that of consumers, the fall will witness an active market and prices firm. We quote:

Southern Coke, No. 1 Foundry	\$14.75 @ \$15.25
Southern Coke, No. 2 Foundry	14.25 @ 14.75
Southern Coke, No. 3 Foundry	13.75 @ 14.25
Southern Coke, Gray Forge	13.25 @ 13.75
Southern Coke, Silver Gray	14.00 @ 15.00
Southern Charcoal, No. 1 Foundry	17.50 @ 18.50
Southern Car Wheel, Standard Brands	22.50 @ 23.50

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth St.,
ST. LOUIS, August 18, 1890.

Pig Iron.—The market fails to show any radical change since our last report. There is a fair amount of business being transacted and prices are quoted with more firmness than for some weeks past. Consumption is gradually increasing, and inquiries are received that indicate some large purchases in the near future. There is still some complaint regarding the supply of No. 1 Foundry and No. 2 Soft Irons, which have been more or less scarce for the past three months. The outlook for the future is decidedly encouraging, and unless all signs fail, the next few weeks will show a somewhat higher market. Trade during the week under review has been restricted to lots of 100 tons and less, and it is noticed that there is less disposition among consumers to ask for concessions. A canvass among the various manufacturing concerns indicates an unusual degree of prosperity, and the outlook for a large full trade is decidedly encouraging. We quote as follows for cash, f. o. b. St. Louis:

Southern Coke, No. 1 Foundry	\$16.00 @ \$16.25
Southern Coke, No. 2 Foundry	15.25 @ 15.50
Southern Coke, No. 3 Foundry	14.75 @ 15.00
Gray Forge	14.25 @ 14.50
Southern Charcoal, No. 1 Foundry	18.00 @ 18.50
Southern Charcoal, No. 2 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 1 Foundry	17.00 @ 17.50
Missouri Charcoal, No. 2 Foundry	16.25 @ 16.75
Ohio Softeners	18.00 @ 19.00

Bar Iron.—The activity which has characterized this department for the past two months continues to be the feature. Mills are so well filled with orders that they are temporarily out of the market, and are unable to promise shipment earlier than September 15. Prices are strictly adhered to, as follows: Lots from mill command 1.90¢ @ 1.95¢; small lots from store are quoted at 2¢.

Barb Wire.—Trade in this department continues to be quite active for the season; more especially so does this apply to Texas points, to which places freight rates have been cut, thus enabling mills to book orders which under ordinary circumstances would not be received until the middle of September. Under date of

August 15 prices were advanced to the following: Painted, 3.05¢; Galvanized, 3.65¢; Carload lots 10¢ $\frac{1}{2}$ cwt. less than above prices.

(By Telegraph.)

The movement in Pig Iron is restricted to small lots for immediate shipment, for which full prices are readily obtained. The demand for Barb Wire is large and increasing, and prices are fully maintained at the recent advance. The demand for Wire Nails is unusually heavy, and prices are advancing. Under date of the 15th inst. local mills advanced the price of carload lots of Wire Nails to \$2.55, and are out to-day with a new card quoting \$2.65. Heavy consumption, coupled with the fact of a short supply, is the reason for the recent advance, and indications point to higher figures in the near future.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, New York, August 20, 1890.

A marked feature during the past week has been the rising tendency of the foreign markets. Importers here lost some pending sales through the upward movement, and in some lines can sell only subject to confirmation from the other side.

American Pig.—The market is quiet, some sales agents reporting it very dull, while others claim to be receiving a fair run of small orders. Southern furnaces outside of the Birmingham district are weaker. Prices remain unchanged at \$17 @ \$18 for No. 1 and \$16 @ \$16.50 for No. 2 Foundry, good Northern brands, while Southern Irons are selling at \$17 @ \$17.25 for No. 1, \$16 @ \$16.25 for No. 2 and \$15 @ \$15.25 for No. 3.

Old Rails.—Aside from the sale of a small lot at \$24.25, no transactions are reported. It is claimed that Pittsburgh consumers have bid an equivalent of \$24.50 here. The majority of holders are asking \$25. The price abroad has advanced to a parity of \$25.25. Old Steel Rails have sold at \$21.

Fastenings.—There has been more stiffening. Some of the Spike makers seem inclined to return to the idea of forming another association, in spite of the fact that their experience in the past has not been very favorable to such schemes. Angles are now held at 1.80¢ @ 1.90¢, delivered.

Steel Rails.—The only transaction of any consequence closed by Eastern mills has been the sale of a lot of 4000 tons for Southern delivery. Negotiations are pending for a few blocks of moderate size for the same section of the country, but otherwise the market is very quiet. Selling agents and Rail mill managers generally talk in an encouraging manner, but the fact remains that for suitable delivery more than one mill would quietly make earnest efforts to secure the business. The market is easier, quotations for fall delivery being \$30.50 @ \$31. Nothing of any consequence was done at the Long Branch meeting of the Rail manufacturers, whose interest in the association has now become very small indeed. The reports of the Board of Control show sales up to August 1 of 1,273,444 tons out of an allotment of 1,600,000 tons, of which the shipments are 826,740 tons. This indicates that the allotment will not be reached this year, but it does not apparently guide mills in their sales.

Spiegeleisen and Ferromanganese.—A Pittsburgh Rail mill has bought 2000 tons of 20 % German Spiegeleisen at \$30, ex-ship, Baltimore. The market is quiet, but

it is doubtful whether the same price can be made again, because an advancing tendency has developed abroad, both in Spiegeleisen and in Ferromanganese, which we quote \$71.50 @ \$72. English Spiegel is held at \$31.50 @ \$32, while German may be quoted \$30.50 @ \$31.

Steel Billets.—There are rumors that a large block of Billets has been purchased abroad for American account. We hear of no other transactions.

The Carbon Iron Company, of Pittsburgh, Pa., have appointed Edward Corning & Co., of 18 Cortlandt street, New York, and 70 Kilby street, Boston, agents for the sale of their products in all of New York State, all of New England and such portion of New Jersey as lies east of a line running north and south from Trenton.

Financial.

A sharp rise in silver bullion affecting all the speculative markets, a deficiency in the bank reserve, and consequent stringency in call money, the beginning of operations under the new Silver-bill by the Secretary of the Treasury, rumors of an intended strike on the entire Vanderbilt system, conflicting reports respecting the crops and a threatened contest in the United States courts on the part of the railroads, in opposition to recent orders of the Interstate Commerce Commission reducing rates on grain—all these have tended to disturbance. Irrespective of tariff questions, therefore, there is much that operates as an incentive to caution in business transactions. Nevertheless, the distributive movement in trade has been more pronounced, there being numerous buyers in town, as noticed more particularly in the dry goods jobbing trade, where there is increasing activity. All sections South and West are represented. In groceries, too, there is a good record. The volume of business throughout the country continues large. The aggregate clearings of 56 cities for the week shows an increase of 13%. New York gained 15, Boston, 17; Chicago, 13; Buffalo, 158; Pittsburgh, 24; San Francisco, 13; Milwaukee, 45; Detroit, 45; Denver, 27; Minneapolis, 33; Duluth, 113, Washington, 48; Portland, Ore., 33.

The stock market was dull, despite considerable buying in London. Stringent money and railroad strikes had an unfavorable influence. A feature was a sharp rise in silver certificates, based upon an advance in silver bullion in London and prospective buying for the Treasury. Disappointment was caused by the non-receipt of advices from Washington in reference to the new policy of the Government respecting bond purchases. On Tuesday cables reported lower prices in London for Americans, and this news and the rumor that a general strike would be ordered on all the Vanderbilt lines made the market unsettled and weak. About the only strong property was silver bullion certificates, which rose to 121. The final vote on the Butterworth bill defining options and futures, and imposing special taxes on dealers, will be taken up on Wednesday next. This bill, should it become a law and be enforced, would abolish all the cotton and produce exchanges in the country.

The Treasury Department on Tuesday afternoon issued a circular providing for the immediate redemption of \$15,000,000 $\frac{1}{2}$ per cents at \$1.04 $\frac{1}{2}$. As all the $\frac{1}{2}$ per cents mature on September 1, 1891, the present offer respecting the \$15,000,000 is equivalent to paying for them par and interest to maturity less the current quarter's interest. The new certificates issued by the Treasury on silver purchases found their way into circulation on Tues-

day. The Fourth National Bank was the first to receive the new bills. It will take several days, perhaps weeks, to get the smaller denominations to be printed.

The merchandise markets have been more or less influenced by the advance in silver bullion. Wheat was excited and active, jumping on Monday and Tuesday at the rate of 2 $\frac{1}{2}$ ¢ @ 2 $\frac{3}{4}$ ¢ a day, stimulated by unsatisfactory weather reports and fear of delay in crop movements by railroad strikes. Corn advanced, with the effect of checking exports. Ocean freight rates in consequence are depressed. Coffee and sugar are sold more freely, at hardening prices. Teas in fair demand, though it is said that increased cost makes buyers more cautious. The weekly statistics of exports from New York are delayed at the Custom House. Imports were \$7,596,000.

United States bonds are steady. Quotations as follows:

U. S. 4 $\frac{1}{2}$ %, 1891, registered.....	102 $\frac{3}{4}$
U. S. 4 $\frac{1}{2}$ %, 1891, coupon.....	103 $\frac{1}{4}$
U. S. 4%, 1897, registered.....	123 $\frac{3}{4}$
U. S. 4%, 1897, coupon.....	123 $\frac{3}{4}$
U. S. currency 6s, 1895.....	112 $\frac{1}{2}$

The associated bank statement showed a loss of \$1,941,725 in reserve, which not only wiped out the surplus but left them \$655,725 below the legal limit of 25 % on deposits. The loss in the reserve results from a decrease of \$8,397,100 in deposits, \$2,652,800 in specie and \$1,388,200 in legal tenders. The loans were also reduced \$3,975,600. The statement, though unusually bad, creates no uneasiness in view of the large additions that will now be made to the volume of legal tender paper through the silver purchases, and the fact that a large surplus in the Government Treasury is available for bond buying or depositing with the bank depositaries.

Banks and trust companies have loaned very little beyond supplying needy customers. Rates for commercial paper are nominal. Time loans for all dates are 6 %, only first-class collaterals accepted. In Chicago money is in demand, especially by manufacturers and operators in grain and provisions at 6 $\frac{1}{2}$ % @ 7 %. New York was heavily drawn upon by Western cities. The Clearing House gave notice that Treasury checks given for silver bullion must be presented at the Sub-Treasury by the banks and not through the exchanges.

Sterling exchange was irregular and owing to active money the tendency was lower. Posted rates are \$2.84 $\frac{1}{2}$ @ \$4.88 $\frac{1}{2}$.

The purchases of silver bullion under the act of last July commenced on Wednesday and certificates have steadily advanced from \$1.12 $\frac{1}{2}$ to \$1.17 $\frac{1}{2}$ on Saturday and \$1.20 $\frac{1}{2}$ on Monday. The total acceptances up to date are 1,449,177 ounces, or about one-half of the quota for August. At the highest price paid the bullion value of the silver dollar is \$0.9262. Bar silver in London advanced to 54 $\frac{1}{2}$ @ $\frac{1}{2}$ d. per ounce. One effect was the sale by the Mexican Central, in which its revenues are paid, of Mexican silver dollars at 89 $\frac{1}{2}$ ¢, the highest price realized for eight years. By the operations of the present law, if not interfered with by speculators, the daily increase in the legal tender money of this country is about \$170,000, or \$5,100,000 per month, or over \$60,000,000 per annum. This is new money which, the day before its issue, was merchandise purchased and sold at so much per ounce. It requires no appropriation from the funds which are in the Treasury to pay for it, because the purchase creates the Government promise to pay, stamped a legal tender for all debts, public and private.

A statement of the resources and liabilities of the trust companies of this State, 26 of which are in New York and Brooklyn, show that these companies have \$104,974,386 on deposit in trust, and \$124,537,051 in general deposits. They are paying

interest upon \$211,705,800 of deposits; have a surplus fund of \$26,598,151, and \$3,719,803 of undivided profits. In the past six months they have paid dividends of \$1,210,610. Capital stock paid in in cash \$24,787,000.

The 13 savings banks in Brooklyn have aggregate total resources of \$112,970,981.62, and the amount due depositors is \$96,607,734.22. The strongest of the 13 banks is the Williamsburg, which has resources of \$34,658,251.15, and owes depositors \$29,642,571.03.

Exports of cotton from all ports in the United States for the month of July aggregated \$2,730,876, against \$2,946,310 in July, 1889. Total for 11 months ending July 31, 1890, \$246,465,006, against \$231,520,204 in the same period of 1889.

The exports of cattle during July, as returned to the Bureau of Statistics, were 35,609, valued at \$2,916,848, in 1890, and 29,417, valued at \$2,377,322 in 1889. The exports of hogs in July were 2805, valued at \$22,659, in 1890, and 6627, valued at \$49,324, in 1889. The value of the exports of beef and hog products during July was \$9,820,338 in 1890 and \$9,885,367 in 1889. The total for nine months ending July 31 was \$88,378,987 in 1890 and \$74,305,124 in 1889. The value of beef, hog and dairy products together exported during the seven months ending July 31, was \$75,020,431 in 1890, against \$65,794,498 in 1889.

Coal Market.

For the first time this season there is a somewhat improved feeling in Anthracite Coal, the small sizes being in better demand. Lehigh, which has been selling at \$3.75 for Stove, f.o.b., and Chestnut 10¢ less, can to-day be bought at these rates only in small lots, and the market is strong. Broken and Egg, steam sizes, lately selling at \$4, may be quoted 10¢ higher. Free burning Anthracite Stove is about \$3.75. Notwithstanding the apparent attempt to reduce the output of Anthracite by letting some 15 collieries remain idle, the production for the week last reported was about 800,000 tons, as against 785,000 for the corresponding week of 1889. The total production so far this year has been 19,679,008 tons, which is 282,818 tons less than the production at this date last year. Excessive production is the weak point in the market, so that September prices are still in doubt. It is understood that the output for August and September respectively shall not exceed 3,250,000 tons. Shipments to Port Richmond last week were 30,000 tons; to Port Liberty, 19,000 tons. Freights to Boston are at the lowest point; vessels plenty. At Buffalo there are reports of scarcity, on account of railroad strike.

The stock of Coal on hand at tidewater shipping points, July 31, 1890, was 751,231 tons; on June 30, 1890, 720,506 tons; increase, 30,725 tons.

Bituminous Coal is quiet.

A coal storage plant will shortly be erected by the Lehigh Valley Coal Company at South Plainfield, N. J., with a capacity of 310,000 tons, the Coal being stored by machinery in 14 conical piles. Six heaps will contain 30,000 tons each. This will be a nucleus for a storage system having a capacity of 1,380,000 tons in 60 piles.

One of the most valuable tracts of land in Pittston, comprising 86 acres, has been sold by the Pittston Coal Company to the Newton Coal Mining Company for a consideration of \$400,000.

Much damage to Coal properties near Wilkes-Barre by a tornado is reported.

An increase of 5¢ per ton is demanded by miners in the Clearfield region, and

a meeting to arbitrate will take place August 27.

Metal Market.

Copper.—It is understood that consumers have been practically assured that they may safely calculate upon obtaining supplies of Lake Superior Copper for the balance of the year at 17¢ per lb. The Calumet and Hecla Company are alleged to have offered to book orders at that price covering deliveries to and including December, and similar offers have been made from other quarters. Naturally, under these conditions, consumers are buying little or nothing over and above what may be required to meet current wants, and speculation is practically at a standstill. There is no pressure of supplies for sale from any quarter, however, nor offers at less than the prices above quoted. Arizona Ingot is a shade easier, having been sold at 15½¢, against 15½¢ generally quoted. For Common Casting Brands 14½¢ is named by sellers, but sales have been made of small lots at a fraction less.

Pig Tin.—Straits Tin has advanced about ½¢ per pound during the past week. The rise is due chiefly to the upward movement of prices in the London market consequent upon the advance in silver and probable light receipts from the sources of supply this month. Transactions in the local market have been rather more extensive than during the preceding week, however, and it is understood that 250 tons or more have changed hands outside of the dealings on the Exchange. Purchases for consumption have also been of rather larger volume, but not on any unusual scale. Store quotations are about 21 35¢ for 5-ton lots and 21.45¢ @ 21.50¢ for smaller quantities. The Exchange quotations on 10-ton lots were 21.25¢ bid, 21.50¢ asked spot; 21.25¢ @ 21.35¢ August delivery; 21.25¢ @ 21.30¢ September delivery, and 21.20¢ @ 21.30¢ October delivery. A prominent holder offered Wednesday to take all August delivery at 21.30¢ that was offered.

Pig Lead.—Dealings in this metal have been on a rather larger scale. Apart from speculative transactions on the Exchange to the extent of about 300 tons, sales of at least 600 tons have taken place at prices ranging from 4.55¢ to 4.65¢ for lots of 50 @ 100 tons or more, and single carload lots have brought as high as 4.70 @ 4.72½¢. The advance is due to favorable statistical position, as revealed by inquiries from consumers for supplies. At present there is comparatively little Lead in this market, and nearly all of it is controlled by one firm. Supplies in the West are found to be reduced to moderate proportions also, and the output, to all accounts, is very little, if not all, in excess of the current consumption. Smelters offer with unusual reserve for future delivery, and some claim to be sold up on their September production.

Spelter.—The market has continued to gradually gain additional firmness, and is quite strong at the present time. There are now but a few carloads of prime Western on the spot, and very little is offered for shipment from the West next month by smelters, the majority being well sold up. The demand is very fair and the consumption liberal. Prime Western may be quoted at 5.55¢ @ 5.60¢ on the spot, and 5.50¢ @ 5.55¢ for shipment.

Antimony.—There has been little change. Supplies are ample and the demand is fair. Current prices are 20¢ for Hallett's, 23¢ for Cookson's, and 21½¢ for LX brand.

Tin Plate.—The market is in a very unsettled condition, and prices cannot be quoted with any accuracy. Spot stock may be had in a limited way at about the

figures given below; but owing to speculative excitement in the foreign market, based upon progress of pending tariff legislation on this side of the Atlantic, it would be very difficult to secure futures except at 15¢ @ 20¢ advance on those quotations. Spot business has been very fair, but the excited condition of the market checks operations in futures. Quotations for large lines, on the spot, are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$4.65; J. B. grade, do., \$4.70; Siemens Steel, —; Bessemer do., \$4.70. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$4.75; Siemens Steel, IC basis, \$4.85 @ \$4.90; IX basis, \$5.85. IC Charcoals—Calland grade, IX, \$5.50; Melyn grade, \$5.70; for each additional X add \$1.50; Allaway grade, \$4.95 @ \$5.00; Grange grade, \$5.10; for each additional X add \$1. Charcoal Terres—Worcester, 14 x 20, \$4.90; 20 x 28, \$9.80; M. F., 14 x 20, \$7.10; do., 20 x 28, \$14.00; Dean, 14 x 20, \$4.65; do., 20 x 28, \$9.20; D. R. D. grade, 14 x 20, \$4.45; do., 20 x 28, \$9.00; Mansel, 14 x 20, \$4.55; do., 20 x 28, \$9.10; Alyn, 14 x 20, \$4.65; do., 20 x 28, \$9.20; Dyffryn, 14 x 20, \$4.70; do., 20 x 28, \$9.25; Wasters—S. T. P. grade, 14 x 20, \$4.25; do., 20 x 28, \$8.60; Abercarn grade, 14 x 20, \$4.25; do., 20 x 28, \$8.50.

New York Metal Exchange.

The following sales are reported:

MONDAY, August 18.

116 tons Lead, August.....	4.60¢
132 tons Lead, August.....	4.62¢
20 tons Tin, August.....	21.15¢

TUESDAY, August 19.

20 tons Tin, September.....	21.25¢
25 tons Tin, September.....	21.30¢

Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, August 19, 1890.

Pig Iron.—No important change in the general situation during the week under review. There is an increasing demand, but it is chiefly to supply immediate or nearby requirements. The cooler weather of the past week has caused a considerably increased consumption, and as there is a very active demand for the products and the mills are all busy, consumption will continue large for some time to come. Production, however, is large and increasing. Carnegie, Phipps & Co. have just started up a new furnace, said to be one of the largest in the country, and older furnaces now undergoing repairs will be started up as soon as the same are completed. The general situation at present warrants the belief that there will be an active market during the remainder of the present year, with no important change in prices, which we quote as follows:

Neutral Gray Forge.....	\$15.25 @ \$15.50, cash.
All Ore Mill.....	16.00 @ 16.50, "
White and Mottled.....	14.50 @ 14.75, "
No. 1 Foundry.....	17.25 @ 17.50, "
No. 2 Foundry.....	16.25 @ 16.50, "
Charcoal Foundry.....	21.50 @ 22.50, "
Coal Blast Charcoal.....	26.00 @ 30.00, "
Bessemer Iron.....	18.00 @ 18.50, "

Bessemer Iron sold during the week to a fair extent at \$18.50, cash. One large block was reported at the price quoted; however, some consumers are holding back, in expectation of being able to buy at inside quotation. Reports sent from here to New York in regard to a prominent firm "bearing" the market both for Iron and Steel are not well substantiated. No one appears to have any knowledge of the aforesaid "bear" movement. The firm at which the report in question is known to be directed has been doing little or nothing in a speculative way for a year or more, and why such a report should be started is beyond the compre-

hension of the trade generally. It may be stated in this connection that while there is now a very large business, both in Iron and Steel, there is an almost total absence of speculation. The demand is almost wholly for actual consumption and business is being done by the producer and consumer, with the aid of the brokers to bring them together.

Muck Bar.—There is a continued good demand, especially for immediate or nearby delivery, and the market is firm and higher. Sales are reported at \$29.50 @ \$30, cash. Those mills making a specialty of making Bar for sale are very busy, and the margin for converting is larger than it has been for some considerable time.

Manganese.—Still reported slow; most of the large consumers are well supplied here; the demand is chiefly for small lots. Small sales of 80 % at \$74 @ \$75 $\frac{1}{2}$ ton. An order for a round lot would probably be placed considerably below the above quotation.

Manufactured Iron.—There is a continued active demand for nearly all kinds of Manufactured Iron; the mills not only here but in the Shenango and Mahoning Valleys are all very busy, and now with cooler weather they are enabled to increase their output considerably, which during the greater part of the summer was very much curtailed, because the men were unable to work, owing to the intense heat. The mills are nearly all behind with their orders in consequence. Prices are firmer and for some kinds higher. Bars are now quoted at 1.90¢, 60 days, 2 % off for cash. Plate and Tank, 2.20¢ @ 2.25¢; No. 24 Sheet, 2.85¢ @ 2.90¢; Skelp, 1.80¢ @ 1.85¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared.

Nails.—There is an increased demand reported for Steel Cut Nails, and a considerably improved business is looked for from now on until the advent of the winter season. July was a very dull month, and the first half of August was not much better. We quote Steel Cut \$1.85, in car lots, 60 days, 2 % off for cash. Iron Nails are about 10¢ $\frac{1}{2}$ keg less than Steel. A continued good demand is reported for Wire Nails, and prices are still tending upward; we quote \$2.45 @ \$2.50, in car lots, 60 days, 2 % off for cash. A manufacturer reports having refused an order yesterday for 2000 kegs at \$2.45. The factory of Carnegie, Phipps & Co., which has been idle for some considerable time, will be started up again shortly. The new factory of the Braddock Wire Company is running up to its full capacity.

Wrought Iron Pipe.—There is nothing really new to note in connection with this important interest. The mills are all reported as busy as they can be, and it would be difficult to place a large order for immediate or nearby delivery. Prices firm, but unchanged.

Structural Iron.—Mills here are very busy. Never before, possibly, were there so many large buildings of one kind or another going up, as well as bridges, all of which require more or less Structural Iron or Steel, and contractors are now anxious to get all the work they can complete before the bad weather sets in, hence they are pressing the mills for material. Angles, 2.20¢ @ 2.25¢; Channels and Beams, 3.10¢; Tees, 2.80¢ @ 2.85¢; Steel Sheared Bridge Plate, 2.65¢ @ 2.70¢; Universal Mill Plates, Iron, 2.35¢; Refined Bars, 1.90¢ @ 2¢.

Steel Plates.—Prices remain unchanged. Fire Box, 4.25¢ @ 4.75¢; Flange, 3.20¢ @ 3.25¢; Tank, 2.70¢ @ 2.75¢.

Merchant Steel.—Tool Steel, as to quality and brand, 8¢ and upward; Crucible Spring Steel, 4¢; Crucible Machinery, 4 $\frac{1}{2}$ ¢ @ 5¢; Open Hearth Steel, base

sizes, 2.75¢ @ 3¢; Bessemer Machinery Steel, 2.35¢ @ 2.40¢; Tire Steel, 2.50¢ @ 2.60¢ rates.

Wire Rods.—There is considerable inquiry, and with a light production prices are steady at \$44.75 @ \$45, cash, at maker's mill. The only mill here in condition at present to sell quotes at \$45, cash, at mill.

Old Rails.—The supply of Old Iron Rails continues light, and while there does not appear to be so much inquiry prices are firm as quoted a week ago, \$27 @ \$27.50, cash. Old Steel Rails continue scarce and in request; may be quoted at \$21.50 @ \$22.50 for short and long pieces.

Railway Track Supplies.—Demand fair, prices unchanged. Spikes, \$2.15, 30 days, on cars at works; Splice bars, Iron, 1.95¢ @ 2.05¢; Steel ditto, 2¢ @ 2.10¢; Track Bolts, 2.85¢ with Square and 3¢ with Hexagon Nuts.

Billets and Slabs.—The demand for Billets continues light and the market is weaker. While so far as we are advised there have been no sales below \$30.50, cash, at maker's mill, it is probable that a desirable order could be placed at \$30. Bessemer Pig is weak and Billets are sympathizing.

Steel Rails.—There does not appear to have been much new business placed here lately, but the mills are well sold up for several months and may be quoted at \$31.50 @ \$32.50 cash, at mill, according to character of order and delivery. There is a good deal of inquiry for small lots on immediate or nearby delivery, and for these small lots full prices are realized.

Old Material.—There is a continued increasing demand, especially for Scrap Steel, and prices are steady. Sales of No. 1 R. R. Wrought Scrap at \$22.50, net ton; Car Axles, \$28 @ \$29 net for Iron and Steel; Cast Scrap, \$16 @ \$16.25, gross; Old Car Wheels, \$18 @ \$18.50; Steel Rail and Bloom Ends, \$22.50.

Connellsville Coke.—There is a continued steady demand and prices steady, but unchanged. There is nearly always more or less complaint in regard to cars. Prices are as follows: Blast Furnace Coke, f.o.b. at ovens, \$2.15; Foundry Coke, \$2.45; Crushed Coke, \$2.65 $\frac{1}{2}$ ton of 2000 lb. Prices at other points are as follows:

	Foundry Coke.	Crushed Coke.
On Cars at Boston and points taking Boston freight rates.	\$6.45	\$6.65
On cars at Baltimore.....	4.62	4.82
On cars at Buffalo.....	4.70	4.90
On cars at Cleveland.....	4.15	4.35
On cars at Cincinnati.....	5.10	5.30
On cars at Toledo.....	4.80	5.00
On cars at Detroit.....	4.80	5.00
On cars at East St. Louis.....	5.65	5.85
On cars at St. Louis.....	5.80	6.00
On cars at Chicago.....	5.20	5.40
On cars at Milwaukee.....	5.30	5.50

Freight rates from the regions are unchanged.

There was no ground for the reports sent out from Cleveland and Chicago that prices were to be reduced, and our Coke operators have been a good deal exercised in regard to reports in question.

(By Telegraph.)

Continued good degree of activity is reported in Iron and Steel. Mills and furnaces are all fully employed, but prices remain as quoted in regular report. Sale of 1000 tons Old Iron Rails at \$27.50, and 100 tons Old Steel Rails, long lengths, at \$23.25.

Lewis W. Washington has embarked in the Iron and Steel brokerage business at 96 $\frac{1}{2}$ Fourth avenue, Pittsburgh.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, August 20, 1890.

Speculation in Pig Iron warrants has been on a large scale, and prices have fluctuated widely. Scotch were sold on Tuesday at 49/6, Cleveland at 46/9 and Hematite at 57/3. On to-day's market the latter went at 58/6, Scotch at 49/10 and Cleveland at 46/9. The buying has been chiefly by those connected with the trade, who being oversold were afraid to continue "bear" tactics and covered their short accounts. Outside operators have purchased freely, however, and indications point to still higher prices. Cleveland No. 3, for prompt delivery, is reported scarce. Makers' prices for Scotch brands show comparatively slight change, but there is 1/8 advance on Cleveland and 2/ on Hematite Pig.

Block Tin, after giving way early in the week, has gradually gained strength and advanced to £95. 5/ for prompts. Business has been confined chiefly to continuing prompts falling due, but futures received more attention the past few days, owing to the prospect that supplies from the East will likely continue moderate in consequence of the further advance in the price of Silver.

Copper is much stronger. Merchant Bars have advanced to £59. 10/. The rise is attributed chiefly to covering of short sales on which deliveries are due next month, and purchases of three months' futures by the combination which now holds the bulk of the stock here, and appears determined to maintain prices. The public are not buying at present prices and consumers are waiting. Stocks have decreased heavily during the past fortnight, owing to small arrivals from America.

In Tin Plates a large business has been done, and an abundance of orders is offering. Makers' ideas are now much above those of buyers', but the latter are gradually giving way. Large sales of Bessemer have been made the past ten days, chiefly at 14/6 at Swansea, but 15/ upward is now asked. The Amman furnaces at Swansea have been restarted.

Scotch Pig Iron.—A fairly active business in makers' Iron, and the market firm, with a further advance on some brands.

No. 1 Coltness, f.o.b. Glasgow.....	62/6
No. 1 Summerlee, " ".....	62/
No. 1 Gartsherrie, " ".....	60/6
No. 1 Langloan, " ".....	62/6
No. 1 Carnbroe, " ".....	51/
No. 1 Shotts, " at Leith.....	63/
No. 1 Glengarnock, " Ardrossan.....	60/6
No. 1 Dalmellington, " ".....	53/
No. 1 Eghinton, " ".....	51/

Steamer freights, Glasgow to New York, 1/, nominal; Liverpool to New York, 7/6.

Cleveland Pig.—There is a very fair business, and prices are firm at 1/ advance. Makers' quote 46/ for No. 3 Middlesborough, f.o.b.

Bessemer Pig.—Makers' Iron has merely fair sale, but prices are again higher, in sympathy with warrants. West Coast brands, Nos. 1, 2 and 3, 58/6, f.o.b. shipping port.

Spiegeleisen.—Some increase in the demand and prices firm, but no higher.

English 20 % quoted at 100/, f.o.b. shipping port.

Steel Rails.—The demand has slackened somewhat, but makers are firm at last week's prices. Heavy sections quoted at £5 @ £5. 5/ and light sections £5. 15/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—Makers ask rather higher prices, but the demand continues moderate. Makers quote at £5 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The demand is fairly active and the market looks stronger. Bessemer, 2½ x 2½ inches, £5, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is very little doing, but makers have advanced their prices. Bessemer quoted at £5. 1/3, f.o.b. at N. W. England shipping point.

Old Iron Rails.—No interest has been shown in these and the market is rather stronger. Tees quoted at £3. 2/6, @ £3. 5/ and Double Heads £3. 5/ @ £3. 7/6, f.o.b.

Scrap Iron.—Some improvement in the demand, but no change in prices. Heavy Wrought quoted at £2. 7/6, f.o.b.

Crop Ends.—Prices rather firmer, but the market quiet. Bessemer quoted at £2. 17/6 @ £3, f.o.b.

Tin Plate.—The market is excited and prices are irregular at a higher range. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	16/6 @ 16/9
IC Bessemer Steel, Coke finish.....	15/ @ 15/3
IC Siemens.....	15/3 @ 15/6
IC Coke, B. V. grade.....	14/9 @ 14/10
Charcoal Terme, Dean grade.....	14/3 @ 14/6

Manufactured Iron.—Business has continued moderately active, but prices are without change. We quote, f.o.b. Liverpool:

Staff, Marked Bars.....	£ s. d. @ 9 0 0
Common.....	7 2 6 @ 7 5 0
Staff, Bl'k Sheet, singles.....	7 15 0 @ 7 17 6
Welsh Bars (f.o.b. Wales).....	6 2 6 @ 6 5 0

Tin.—The market firm to-day, but rather dull. Straits quoted at £95. 10/, spot, and £96. 5/ for three months futures.

Copper.—There is less demand, but the market is firm at the advanced prices. Merchant Bars quoted at £59. 2/6, spot, and £59. 10/, three months futures. Best selected, £65.

Lead.—Only a moderate business passing, and little change in prices. Quoted at £12. 17/6 for Soft Spanish.

Spelter.—Prices are somewhat higher, and the market is firm. Quoted at £23. 12/6 for ordinary Silesian.

Imports.

Hardware, Machinery, &c.

American Champagne Company, Mach'y, cs., 3
Baker, Hermann & Co., Mdse., cs., 8; Arms, cs., 38
Dolph, A. M. Co., Mach'y, cs., 13
Field, Alfred & Co., Arms, cs., 8
Folsom, H. & D. Arms Co., Arms, cs., 2
Hartley & Graham, Mdse., cs., 14; Arms, cs., 13
Hersel, Bruckman & Co., Mach'y, pgs., 8
Kittredge Arms Company, Mdse., cs., 2
Lau, J. H. & Co., Arms, cs., 9
Mackull, G. J., Mach'y, cs., 15
Merchants Despatch Company, Arms, cs., 27
Mecham Arms Company, Arms, cs., 10
Matthiessen & Welchers, Mach'y, pgs., 81
Richard, C. B. & Co., Iron Gas Boilers, cs., 37
Schoverling, Daly & Oates, Arms, cs., 24
Sheldon, G. W. & Co., Guns, cs., 8
Smith Granite Company, Mach'y, cs., 15
Tillotson & Power, Mach'y, cs., 6
Witte, John G. & Bro., Cutlery, cs., 7
Ward, Jas. F. & Co., Mach'y, pgs., 87

Werleemann, H. Arms, cs., 24
Wiebusch & Hilger, Mdse., cs., 234; Chains, cs., 25
Wyman, Chas. H. & Co., Arms, cs., 16
Order—Mach'y, pgs., 20; Arms, cs., 10; Mach'y, cs., 5

Cleveland.

(By Telegraph.)

CLEVELAND, August 20, 1890.

The demand for non-Bessemer Ores is still very heavy, and sales are said to have occurred at figures below \$4, f.o.b. vessels lower lake ports. Indications are that the total non-Bessemer output for 1890 will have been sold within three weeks. Lake freights are still declining, and only about \$1 is to-day being paid for charters from Ashland and Two Harbors. The Pig Iron market is without special feature, beyond a slight demand for Mill Irons.

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, }
CHICAGO, August 20, 1890. }

The market is fully as active as it has been, except in Pig Iron. The freight rates from Eastern points are to be advanced September 1 on Bar and other finished Iron and Steel. They will be marked up one class. Carload lots will be 2¢ higher, and less than carloads 3¢. This is expected to stiffen the market, and has already had some effect. The scarcity of skilled workmen reported some time since still continues. There has seldom been a time in recent years when labor was in such demand all over the West.

Pig Iron.—The market was disturbed last week by reports of serious weakness among sellers of Southern Coke Iron, but those who have thoroughly investigated the matter pronounce the rumors false. Although the local demand has been light since our last report, there are no evidences of a lack of confidence among sellers of either Northern or Southern Irons at this point. Prices are very stiff. A great deal of inquiry is current, which makes furnacemen feel hopeful of the future, coming as it does while they are well loaded with contracts. Makers of Soft Irons are having a larger share than usual of the business now transpiring, and increasing scarcity is reported in that grade. The statement made in our report of the 31st ult. that Connellsville Coke shippers were making concessions was incorrect. Coke from other districts was being offered at a lower price, but the Connellsville shippers have steadily maintained their rates. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$20.00 @ \$20.50
Local Coke Foundry, No. 1.....	16.50 @ 17.50
Local Coke Foundry, No. 2.....	16.00 @ 17.00
Local Coke Foundry, No. 3.....	15.50 @ 16.00
Bay View Scotch.....	18.00 @
Am. Scotch (Strong Soft), No. 1.....	19.25 @ 20.25
Jackson County, Soft and Silvery, No. 1.....	18.25 @ 18.50
Southern Coke, No. 1.....	16.50 @
Southern Coke, No. 2.....	16.00 @
Southern Coke, No. 3.....	15.50 @
Southern, No. 1, Soft.....	16.00 @
Southern, No. 2, Soft.....	15.00 @
Southern Gray Forge.....	15.00 @
Southern Mottled.....	14.00 @
Tennessee Charcoal, No. 1.....	19.00 @
Missouri Charcoal, No. 1.....	18.50 @
Alabama Car Wheel.....	22.50 @ 24.00

Bar Iron.—Local mills report more inquiries than they care to quote on. A great deal of Iron has been sold at 1.85¢, half extras, and a 1000-ton lot of Car Iron was placed at 1.85¢ flat. Some heavy specifications are in the market now from large buyers who have been waiting for lower prices, but have been disappointed. Youngstown mills now ask 1.75¢, half extras, at mill, equal to 1.90¢ Chicago

after freight rates advance on the 1st. There seems to be every reason to look for still higher prices, as the mills are full of work, while the buyers are by no means supplied. Store prices firm, but unchanged.

Structural Iron.—More schemes are coming forward which involve the consumption of large quantities of shapes. A heavy demand extending far into the future seems assured in this vicinity. Prices are very firm. The following quotations prevail on carload lots, f.o.b.: Angles, 2.30¢; Tees, 2.80¢ @ 2.90¢; Beams, 3.20¢; Universal Plates, 2.45¢ @ 2.55¢; Sheared Plates, Iron, 2.50¢ @ 2.60¢; Steel, 2.60¢ @ 2.70¢; Car Truck Channels, 2.60¢. Beams sell from store in small lots at 3.70¢, but Angles and Tees at 10¢ @ 15¢ @ 100 above carload prices.

Plates, &c.—The demand continues heavy and mills are advancing prices again. Tubes are very firm and not easy to get. Rivets have seldom been so scarce as now, and orders are coming into this market from Eastern consumers. Store prices will soon have to be changed if present conditions are maintained, but for the present we quote as before: Nos. 10 to 14 Iron Sheets, 2.80¢ @ 2.90¢; do., Steel, 3¢ @ 3.10¢; Tank Iron, 2.65¢ @ 2.75¢; Steel, 2.85¢ @ 2.95¢; Shell Steel, 3.25¢; Flange Steel, 3.50¢; Fire Box Steel, 4.50¢; Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 % off; Tubes, 1½ inch, and less, 40 % off; 2 to 4½ inch, 50 % off; larger, 52½ % off.

Sheet Iron.—Manufacturers of Black Sheets seem to be well supplied as far as they care to contract ahead, and all but very few are now out of the market. These quote No. 27 common at 3.10¢, at mill, and will only take small orders. Jobbers quote same at 3.40¢ from store, and Juniata Galvanized at 60 % and 10 %.

Merchant Steel.—Manufacturers' agents report an excellent trade in Soft and Tool Steels. Soft Steel is firm, with an upward tendency, concessions now being refused which would have been granted a short time since. Prices are as follows: Tire Steel, 2.40¢ @ 2.50¢ rates; Open Hearth Spring and Machinery, 2.50¢ @ 2.75¢; Bessemer Machinery, 2.30¢ @ 2.40¢; Crucible Spring, 3.50¢; Tool Steel, 7¢ and upward; Crucible Sheets, 7¢, 8¢ and 10¢.

Steel Rails, &c.—Rail mills report a good volume of business, enough to make the condition of trade satisfactory, while not giving immediate promise of anything extraordinary. The new mill of the Illinois Steel Company is getting into trim, having already made a good record. Quotations are unchanged at \$33.50. Splice Bars are the subject of frequent inquiry, and are quotable at 2¢ @ 2.10¢ for Iron and 2.25¢ for Steel; Spikes, 2.15¢ @ 2.20¢; Track Bolts, Hexagon Nuts, 3¢ @ 3.15¢, for late delivery.

Old Iron Rails.—These are very firm, but seem to have reached their maximum. Some 3000 tons were sold the past week on private terms, understood to be something above \$26.50. The supply is limited, but consumers are not so urgent as might be expected. Offers of old steel rails are light, but prices are steady at \$19.50 for short pieces and \$22 long lengths. Old Car Wheels are quiet, consumers declining to pay \$19.50 asked by holders.

Scrap.—A very good demand reported for high class material and for Nos. 1 and 2 Mill. Cast is dull, while Borings and Turnings are not wanted in any direction. Dealers are paying \$17 for Mixed Country Scrap. Selling prices are: No. 1 Railroad, \$21.50 @ \$22; No. 1 Forge, \$21; Axles, \$26.50; Half Mill, \$16.50; Stove Plate, \$10.25; Wrought Turnings, \$13; Axle Turnings, \$13.50; Horse

Shoes, \$19.50; Car Axles, \$25.50; Mixed Steel, \$14.25; Coil Steel, \$18; Leaf Steel, \$19; Tire Steel, \$20.

Pig Lead.—Dealers report a quiet local trade but good demand from outside, with sales of over 500 tons mostly at 4.40¢. Closing quotations are 4.40¢ @ 4.45¢.

The Slate Industry of the United States.

Some very interesting statistics relative to the slate industry of this country are contained in a census bulletin issued a few days since by the Department of the Interior. According to the figures there given, the total value of all slate produced in the United States in 1889 is shown to be \$3,444,863. Of this amount \$2,775,271 is the value of the 828,990 squares of roofing slate, and \$669,592 is the value of slate for all other purposes besides roofing. As compared with the census report of 1880 on stone, the roofing slate product of 1889 is nearly twice as great in number of squares and in value. Slate used for purposes other than roofing was omitted from the tenth census report. The total value of all slate produced in 1880 is more than twice as great as that considered in the tenth census. According to "Mineral Resources of the United States for 1888," the total number of squares of roofing slate produced in that year was 662,400, valued at \$2,053,440.

Twelve States at present produce slate. A line drawn on the map from Piscataquis County, Maine, to Polk County, Ga., and approximately following the coast line, passes through all the important slate-producing localities. According to the amount and value of the product, the most important States are, in the order named, Pennsylvania, Vermont, Maine, New York, Maryland and Virginia. In the remaining six States productive operations are of limited extent; and in the case of Arkansas, California and Utah, of recent date.

The regions in which slate is found do not, in all cases, coincide exactly with States, nor, in the case of what is known as the Lehigh regions, with counties, but in a number of instances they overlap the geographical boundaries of State and county. Thus, the Peach bottom region lies both in Maryland and Pennsylvania, and the Lehigh region in Lehigh, Carbon, Berks and a small portion of Northampton counties. The Bangor region, which is entirely within Northampton County, Pa., is the most important. This region includes quarries at Bangor, East Bangor and Mount Bethel, Pa., the character of the slate produced at Mount Bethel being similar to that of the Northampton hard vein region. Included in the Lehigh region, besides Lehigh County, Pa., are a few quarries in Berks and Carbon counties, and a small number in Northampton County, on the opposite side of the Lehigh River. The Pen Argyl region embraces quarries at Pen Argyl and Wind Gap. The Northampton hard vein region is specially distinguished on account of the extreme hardness of the slate as compared with that produced in other regions of the State. This region includes the following localities: Chapman's Quarries, Belfast, Edelman, Seemsville and Treichlers, all in Northampton County. Five of the nine quarries included in the Peach Bottom region are in Harford County, Md., the remaining four being in York County, Pa. The Vermont and New York region includes an extensive slate formation, occupying a part of the old Champlain Valley, lying between the western base of the Green Mountains of Vermont and the southern trend of the Adirondacks, in New York. The area in which slate is actually produced at pres-

ent is confined to a narrow strip in Washington County, N. Y., and a somewhat wider one lying next to it in Rutland County, Vt. It extends from Castleton, Vt., on the north, to Salem, N. Y., on the south, a distance of 35 or 40 miles, and has a maximum width of 6 miles, but the average is not more than 1½ miles. With the exception of red slate, the production of which is at present limited to Washington County, N. Y., the general character of the slate in Vermont and New York is the same. It happens, however, that red slate is produced only in Washington County, N. Y., this being the only locality in the country producing this variety of slate.

The slate quarrymen of the country, and to a considerable extent the firms operating the quarries, are either Welsh or of Welsh descent, many of them having learned the methods of quarrying slate in the celebrated quarries of Wales. The quarries are operated on an average of about 220 days in the year. The idle days are the result of rainy weather and holidays. The first day of every month is regarded as a holiday by the Welsh quarrymen, and no work is ever done by them on Saturday afternoons. The average wages for the entire country paid to foremen or overseers is \$2.48 per day; for quarrymen and millmen, \$1.55; for mechanics, \$1.64; for laborers, \$1.27, and for boys, 76 cents. The highest wages are paid in California, while those paid in the most important regions naturally approximate more closely the figures above given as the averages. The following figures represent the average daily wages paid in Pennsylvania: Foremen, \$2.25; quarrymen, \$1.88; mechanics, \$1.54; laborers, \$1.40, and boys, 73 cents. In the Vermont and New York region foremen receive an average of \$2.65; quarrymen and millmen, \$1.77; mechanics, \$1.97; laborers, \$1.51, and boys, 89 cents.

The following table gives a comprehensive view of the condition of the slate industry during the last year. It shows the number of quarries in each State, the total value of the slate produced and the total wages paid for the entire product:

State.	Number of quarries.	Total value of all slate produced.	Total wages paid for product.
Arkansas.....	1	\$240	\$1,055
California.....	2	13,889	19,927
Georgia.....	4	15,330	11,371
Maine.....	4	214,000	160,300
Maryland.....	5	110,008	65,267
Michigan.....	1	15,000	12,000
New Jersey.....	5	10,925	7,367
New York.....	16	130,603	85,797
Pennsylvania.....	104	2,011,776	1,283,530
Utah.....	1	170
Vermont.....	60	838,013	494,110
Virginia.....	3	85,079	66,920
Totals.....	206	\$3,444,863	\$2,209,344

Inasmuch as in slate quarrying the initial operations are those of stripping and excavating, preliminary to actual output, some time must necessarily elapse before any returns for labor can be realized. This explains why the expenses incurred in Arkansas, California and Utah exceed the value of the output.

Another syndicate that proposes to invite the public to test the veracity of a glowing prospectus is the Chemical Union of London. It is a combination of all the Le Blanc process manufacturers of what are termed in the trade heavy chemicals, and includes all the factories in Great Britain, which is the source of supply for

the United States of the great bulk of alkalis used in the manufactures in this country. The Chemical Union, as it will be called, will be capitalized in £8,000,000, of which the manufacturers agree to take one-third, the remaining two-thirds to be offered to the public.

The Situation in Silver.

The silver kite is now flying at a wonderful altitude, and speculators, who now boast that they are in control of the market, make wild predictions. All that has been said of the folly of silver legislation is, apparently, in course of realization, and business men who seek to guide their course in accordance with current events will not unlikely proceed to "trim ship."

The cable quotation to the Director of the Mint of the price of silver in London on Monday was 54d. per ounce, the highest point which silver has reached since April, 1878. In New York speculative purchases carried the price of certificates to 120, sales reaching 2,293,000 ounces, the largest on record. Brokers write as follows:

CORDLEY & Co.—"An examination of the bids received for the sale of bullion to the Government show that the silver market is under the control of the same 'ring' which pushed the act through Congress."

W. S. LAWSON & Co.—"It is coming to be generally believed that silver will certainly go up to parity with gold. If this be the case, it will bring up values of other things in a remarkable degree."

THE *Financial News*.—"The advance in silver has been of great moment, and as the Secretary is compelled to keep on buying, willy or nilly, holders are quite grudging of their offerings. Silver certificates advanced on Saturday to 117½, reacting to 116½ at close upon realization; but that they are bound to advance still further, per force, appears about as sure a tip as Wall street has ever had. Holders of silver are aware that they have a good steady, permanent customer, and will not be disposed to overmuch sacrifice more profit in the future for the sake of immediate realization. The inflation of prices expected as the result of the passage of the Silver bill is now upon us."

MESSRS. J. A. HAMBLETON & Co., of Baltimore, write: "Speculators will continue to bid the price up on the Government, knowing that the Secretary must buy 4,500,000 ounces each month as long as it can be had at or under 1.29, and the Government is anxious to advance the price to a parity with gold, if possible. The speculation will continue until some day the holders of silver bullion will be compelled to sell. Then will come the deluge."

On three days' trial the price of silver rose 5 per cent., and the Director of the Mint proclaimed that the administration desires to see the price advance—i. e., to a parity with gold. The subject becomes more interesting from day to day.

Illinois is now the third State in the Union in population. For 30 years Ohio kept ahead of it and Illinois was the fourth in population. Its population as fixed by the rough count made in the Census Office is 3,801,285. Ohio won't be able to go much beyond 3,500,000, so Illinois is fully 300,000 ahead. In 1880 the population of Illinois was 3,077,871, so that in ten years the increase has been 723,414.

The strike at the axle works in Wilkes-Barre, after a long struggle, was declared off by the Knights of Labor on Tuesday. About 500 men are at work.

HARDWARE.

The Condition of Trade.

Business generally is reported good for the season, with very fair prospects for the fall trade. Prices remain steady, with few changes. The partial failure of crops in the West from drought and other local causes is not looked upon with apprehension, as the smaller quantity of farm products will doubtless command larger prices than did the abundant crop of last year. There is a feeling of confidence in the South at the prospect of a large cotton crop.

Chicago.

(By Telegraph.)

Hardware.—Heavy Hardware jobbers report trade even better than in July. All classes of consumers and small dealers are in the market. Stocks have been badly broken, and jobbers have had no trouble in running off rapidly the special purchases which they have made. Shelf Hardware continues very active, and some of the leading houses have been working their forces at night to catch up with the accumulated orders. Collections are good, and the only complaints heard are regarding the smallness of margins and the disproportionate relations of expenses to net receipts. Tin Plates are dearer and jobbers are marking up their prices. Otherwise prices are steady.

Nails.—Plenty of inquiries are being received for Cut Steel Nails and sales are increasing. Wheeling makers still quote \$1.85, at mill, for usual specifications, with special rates on high averages. Wire Nails are scarce and dear, and factories quote \$2.55 to \$2.60 Chicago. Jobbers have advanced Wire Nails to \$2.65, from store, with 5 cents off for carloads. They quote Cut Steel at \$2.05 and carloads at \$2, but the latter can be shaded 5 cents in some instances.

Barbed Wire.—Is in fairly good demand, but not enough to make any change in prices. It still sells at \$2.90 for Painted, and \$3.50 for Galvanized.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—We are pleased to report that trade during the two weeks just passed, we feel, has been on the whole fully up to the average of past years. While in some sections crop reports are not as favorable as was anticipated early in the season, in other sections chances are it will be fully up to expectations. The favorable outlook for the cotton crop in the South has created an active market in that section. Trade in our own State and throughout the adjoining States has also improved, with prospects of continued activity. General Hardware and Shelf Hardware have been quite active, although we must report a falling off in the sales of Barbed Wire, Wire Nails and Cut Nails; but with the extensive buildings now under way, active trade in the last two articles must soon

spring up. From the present outlook we feel the prospects for continued activity, and an exceedingly good fall trade may be expected. With the manufacturers we find quite a number of them exceedingly slow in filling orders. A number of lines for which specifications were given early we find manufacturers are unable to fill orders complete. As many of them report working double force or extra time, it certainly can be considered an encouraging outlook for all sides. Changes in prices have been very few; where any have been made they have had an upward tendency. Collections we can report as fair to good.

Louisville.

W. B. BELKNAP & Co.—Notwithstanding unfavorable crop reports from a very large section, as well as a rather close money market in this country and abroad, the summer and early fall business show decidedly satisfactory tendencies. The promise of the largest cotton crop on record makes the large Southern territory tributary to here even more gratifying than usual, while the volume of business in the tobacco and corn country would seem to indicate either that one bad year fails to discourage the business of the country or that reports are exaggerated. The demand for all builders' staples, especially Nails, appears to temporarily exceed the supply. The market features—namely, fluctuations in prices—appear to attract but little attention among either small or large buyers, purchases being universally for actual wants. What the effect of a largely decreased crop in great sections of country and the resulting decrease in railroad tonnage will be is a problem of the future.

San Francisco.

HUNTINGTON HOPKINS COMPANY.—We have to note a general increase of trade all along the line, and also note that there is a tendency for the trade from the South and also from the North to again head toward this city. The southern part of the State is now assuming a more substantial aspect than it has had for some time, and the trade from that section appears promising, and we look for a largely increased amount of it. When we consider the high prices that fruit, which is becoming more and more a staple article of export, brings, we feel justified in stating that this one item alone, without considering our other exports, should make a decided difference in our favor in the volume of trade. The indications are that the high prices now ruling will be maintained.

St. Louis.

There has been unusual activity during the past two weeks, the primary cause of which is the reduction of freight rates to Southwestern points. This action on the part of the railroads has proved a boon to jobbers, as retailers in the sections governed by the cut in freight rates are

placing orders for their fall stocks, and generally speaking these orders call for a complete assortment, indicating a disposition on the part of the retailer to anticipate his wants for some months ahead. The desire to get goods shipped so as to take advantage of these cut rates has been so great that there is little or no complaint regarding prices, and the market can be termed very firm. What the after effect of this sudden activity will be it is hard to determine. It is quite likely to result in keener competition for trade and perhaps prices may come in for a share of the struggle. It is too early to make any conjectures; however, it is enough to say the outlook, from the present standpoint, is certainly very encouraging to jobber and retailer alike.

Omaha.

LEE - CLARKE - ANDRESEN HARDWARE COMPANY.—Not much business is expected by the jobbing trade just at this season of the year, the position being "between hay and grass," as the saying goes; still a steady flow of traffic prevails right along, fully up to the average. Money is easy and merchants are meeting their obligations regularly, indicating an absence of stringency usually expected prior to the time of marketing the new crop. The favorable crop prospect of a few weeks ago was much impaired by the subsequent dry and hot weather, and late reports do not warrant the expectation that the general crop will exceed two-thirds of an average. There are localities in the grain raising country west of us in which the yield will be fully up to an average, and others where it will be nearly so, but in our heaviest corn producing sections the outlook is not entirely satisfactory. It appears some localities have been more favored with the necessary moisture than others, hence crop reports vary considerably on this account. Favorable weather for the next two weeks would improve matters somewhat in those sections which have thus far been the least favored, but at the best a short crop is assured. As to where prices may go is a matter of conjecture, but it would seem our Western farmers are warranted in expecting higher prices for their products than now prevail.

Cleveland.

THE W. BINGHAM COMPANY.—As we anticipated, trade is commencing with a rush. The favorable weather of the last few days seems to have put new vigor into all concerned, and travelers are sending us in orders that leave no doubt in our minds that the fall trade will be all that could be reasonably expected. We note a particularly lively demand for Axes, Cross-cut Saws, Meat Cutters, Sheet Iron Elbows, &c. These orders coming so early in the season would indicate short supplies in the hands of retailers, notwithstanding the prevailing idea that heavy stocks of these goods had been carried over from last year. Prices on all goods are well maintained, and an encouraging feeling of security seems to exist on all lines at the present time. Wire Nails are in good demand, with the same scarcity as reported in our

last letter existing. Manufacturers are holding prices firm, and are unable to keep up with orders. Steel Nails also seem to hold their own, with the demand equal to the supply.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Trade has fallen off from last week, owing to harvesting operations, which are now in full blast throughout the Northwest. Volume of business for July and August has been much larger than for the same period last year. Collections also are much better, and, on the whole, very satisfactory. On account of recent advances in some lines by manufacturers, prices have advanced in the twin cities, and are being fully maintained. Prospects for fall trade are very good, indeed, and as many places where crops failed last year will have good to fair crops this year, many old debts will be paid up.

Portland, Ore.

FOSTER & ROBERTSON.—The middle of August finds this Northwestern country in fine condition, and the fears of a short crop, which were entertained during the spring, are now entirely dispelled. The light rains and cool weather of May, June and July have had a wonderful effect on growing crops and fruits of all kinds, and a yield is expected that will surpass any we have ever experienced. The jobbing trade during the last five months has been unusually large, and collections fair. Owing to the cool weather of the months mentioned the hay and grain harvests are now going on at the same time. Large crops being assured, country merchants are induced to buy very freely. In our city rents are high, notwithstanding the fact that building is unusually active. Many fine stores and several public buildings are now under way. The retail merchants in all lines claim a more profitable and much larger trade than during the same period last year. Real estate, both city and suburban, is rapidly increasing in value, and we believe an era of still greater prosperity is about to dawn upon us.

Baltimore.

CARLIN & FULTON.—Trade is now quite active in this market, the shipments to the South, as usual at this time of the year, being quite heavy. Expectations are for a good trade throughout the fall, based upon continued reports of good crops, though in this vicinity we regret the loss of the entire fruit crop, which has always been cash in the pockets of the farmers. The Nail market, especially for Steel Nails, is much firmer. Owing to the immense orders placed in Europe for Guns and Cutlery, the shipments have been very irregular and unsatisfactory, and we note a great scarcity of most of the staple brands of Pocket Knives, and with the great demand there is for German Guns, an unfortunate scarcity of the same. The market generally seems to be in a healthy condition, owing to the fact that the extreme heat has probably curtailed production at many manufacturing points, while a fair demand for goods has prevented any declines of consequence.

Barb Wire.

The market continues very quiet. Manufacturers are firm in their views, without change in quotations.

Cut Nails.

The New York market has been irregular, through the offering of a lot of Nails by one party. We continue to quote \$1.75 to \$1.80 for Iron Cut Nails in carload lots on dock.

Wire Nails.

The market is quite active, and the supply somewhat restricted. We quote \$2.50 to \$2.55 in carload lots on dock.

Miscellaneous Prices.

The New Jersey Saw Company, organized very recently, having already been dissolved, the Saw manufacture of the country is practically consolidated into two strong organizations, Richardson Bros., Newark, Harvey W. Peace & Co., Brooklyn, N. Y., and E. C. Atkins & Co., Indianapolis, Ind., being either owned or controlled by Henry Disston & Sons, while Wheeler, Madden & Clemson, Middletown, N. Y., Woodrough & McParlin, Cincinnati, Ohio, and Woodrough & Clemson, Boston, are consolidated in the National Saw Company, with a New York house, through which all orders are received. It is understood that the companies bought out by Henry Disston & Sons, and those which they control, will be run in the future as they have been in the past. E. C. Atkins & Co., Indianapolis, Ind., have revised their prices to the trade, as follows:

Circular Saws, Shingle and	
Heading Saws..... Dis.	50 per cent.
Mill, Mulay and Drag Saws..	40 "
Silver Steel Diamond Crosscuts..	20 70 per foot.
Special Steel Dexter Crosscuts...	50 "
Rex Segment Ground Crosscuts...	50 "
Special Steel Diamond Cross-	
cuts.....	32 "
Tuttle, Electric and other styles	
of Crosscuts.....	30 "
One Man Saws, with handles...	40 "
Hollow Back Crosscut Saws, with	
handles.....	20 "

HANDLES.

No. 1 Loop.....	28 per pair.
No. 2 Loop.....	13 "
Nos. 2 and 4 Reversible.....	18 "
No. 6 Loop.....	13 "

SAW TOOLS.

Perfection	\$12.00 per doz.
Excelsior.....	6.00 "
Giant.....	4.00 "
Dexter.....	4.00 "
Criterion Saw Sets.....	6.00 "
Lever	6.00 "
Adjustable	6.00 "
Saw Guages, single	50 "
" double.....	75 "
Setting Blocks for Crosscut Saws..	2.00 "

The Payson Mfg. Company, Chicago, quote the following revised discounts on Payson's Transom Lifters:

Payson's Universal Bronzed Iron, Bronze	
and Plated Lists.....	60 %
Payson's Solid Grip Bronzed Iron, Bronze	
and Plated Lists.....	60 %
Payson's Imperial Solid Bronze and Plated	
Lists.....	50&10 %

The Cronk Hanger Company, Elmira, N. Y., have changed the discount on their Carrier Anti Friction Hanger to 50 and 10 per cent. There is no change in the others.

Attention is directed to the Best Yet Can Openers which are just being placed

on the market, an illustration and description of which we give in this issue. These are intended to retail at 15 cents each. The price is \$1.25 per dozen with a quantity discount.

Cordley & Hayes, 173 and 175 Duane street, New York, agents for the Indurated Fiber Ware, under date of August 1, announce a reduction in prices, the lists now being:

Store Barrels and Fire Casks:	
Nos. 1 and 2, per dozen.....	\$50.00
Nos. 3 and 4, ".....	40.00
Dry Store Barrels:	
No. 1, per dozen.....	\$44.00
No. 2, ".....	36.00
No. 3, ".....	23.00
No. 4, ".....	27.00

They also illustrate in the circular, Fire Casks, Oyster Pails, Florists' Vases, Cheese Covers, Mill Dippers, Beer Trays, Pickle Tubs and Sitz Tubs.

Recent changes reported in the price-lists of Handled Hoes and Forks are the result of a new association, which has been entered into by the principal makers of Steel goods. The present agreement does not attempt to fix selling prices directly, but, if adhered to, will result in a firm market for these goods and profitable prices. Manufacturers will equalize freights. An apportionment of sales at list prices has been made to every concern, and to remove any incentive to increase sales beyond the allotment, each manufacturer is required to pay to the association a considerable percentage on list prices of such excess, which money will be divided according to the allotment. This arrangement removes all incentive to force sales by low prices.

The Capitol Mfg. Company, Chicago, have advanced the prices of their Acme Wrenches to discount 50 and 2 per cent. for Bright, and 40 and 2 per cent. for Nickeled. They explain that this advance has been made necessary by the increased cost of material, together with some expensive improvements which they have made in the Wrench.

Cordage.

The National Cordage Association, which was organized in 1887 under the laws of the State of New Jersey, with a capital of \$15,000,000, has sold out \$5,000,000 of this stock to enable the association to bring about the practical consolidation of all of the manufacturers of cordage in the United States, Canada and, possibly, Great Britain. The plan is an extensive one; as a matter of fact, it will be simply an enlargement of the present organization. There is in the present case no reorganization and no increase of stock. Some members of the association have sold out a number of shares pro rata. The association at present owns 17 of the largest cordage mills in this country and in Canada. There are outside of the association perhaps 12 or 15 mills. The object in selling this \$5,000,000 worth of stock is to enable the association to purchase all these mills and get absolute control of the cordage manufacture in this country and Canada. The stock has always, it is said, paid a handsome dividend, and the only object in selling it was to enable the association to buy up all outside concerns. The officers of the association emphasize the statement that they are not forming a "trust," but simply a corporation; their object being not so much to control the

selling and market price of cordage manufacturers as to control the buying of the raw materials. They assert that the result will be a great lowering of the price of Twine, Rope, &c., in this country and Canada. The raw materials are produced largely in the Spanish dependencies; with many buyers, as the supply is strictly limited, the result is that competition among buyers forces up the price of the raw materials. In some cases the raw material has been held 50 per cent. higher one year than another, simply from this competition in buying. The prices have for a number of years fluctuated greatly. Under the new condition of affairs—and this the public are led to understand will be the chief result of consolidating all the cordage interests in America—there will be but a single buyer and, therefore, no competition. The Spanish growers are not pleased with the situation, as is shown by several letters from them, protesting against the consolidation of interests. It is understood that at different times the association has been pressed by an English syndicate to sell a block of this stock, but they have declined, because they wished to have it all taken up in America. They expect in the future to get their fibers at least 30 per cent. less, and this will make a large saving annually to American consumers in the cost of raw material. They promise a great gain to farmers, who use from 30,000 to 50,000 tons of Binder Twine each year in binding grain alone. We have thus summarized the case as the promoters of the movement present it to the public, who will naturally form their own conclusions as to the probability of any advantages resulting to them if the control of the market shall rest in the hands of this organization.

Catalogues, Price-Lists, &c.

The Kentucky Bell Company, 1509 Jackson street, Louisville, Ky., issue a circular of J. Geo. Dodge's Genuine Kentucky Stock Bells. This brand of Stock Bells has been sold for over half a century, and we are advised that the sales now extend not only over the United States and Territories, but also to South America and Australia. Hereafter all Bells will be shipped from the factory direct, as they have no agents for the sale of their goods.

The Illinois Iron and Bolt Company, Carpentersville, Ill., issue a supplement to their catalogue, illustrating Champion Steel Wagon Skeins, Car Box Jack Screws, Cheney's B. S. Cone or Mandrel and Clark's Tuyer Irons. These goods are referred to as having lately been put upon the market and as worthy of especial attention.

The Warner Mfg. Company, Freeport, Ill., manufacturers of Hardware specialties, issue a catalogue illustrating the goods made by them. These consist of the Warner, Heofer & Stover Door Springs, Box and Side Coffee Mills, the U. S. Schofield and Hame Stove Pipe Dampers, Baltzly's Improved Patent Hand Truck, Bartlett's Combined Barbed Wire Lifter, Stretcher, Cutter and Staple Puller, and Bunker's Adjustable Stove Repairs. The point is made that they continue to warrant every article made by them.

H. H. Harvey, 116 and 118 High street, Boston, Mass., issues an illustrated catalogue and price-list of stonecutters', quarrymen's, miner's, railroad, grist mill, cooper's, blacksmith's and slater's Hammers, Sledges, Tools and Outfits; also Handles, Steel Sleds, &c. Attention is called to the fact that they carry a stock of 75 to 100 tons of Hammers and Tools ready for shipment at short notice. Because of many important changes in this from their old catalogue, it is requested

that all the old books be destroyed, and that orders be made up from this one only.

T. E. Browne, 44 South Spring street, Los Angeles, Cal., issues circulars of his improved Tea and Coffee Urn. The earthen jars used to hold the tea and coffee are referred to as standing any degree of heat or cold, and will not discolor or poison the tea or coffee like tin or copper. These are made with heavy tin, highly polished copper, or nickel plated casings. Mr. Browne also sends circular of his Squirrel and Gopher Smoker, which he claims to be the cheapest, safest and most effective method of killing squirrels, gophers, rats, prairie dogs, mice, &c.

The Central Expanded Metal Company, 116 Water street, Pittsburgh, Pa., issue a circular describing the improved method of house construction and plastering by using expanded metal in place of wood lath. The advantages resulting from the use of expanded metal are enumerated, and testimonials from those who have used it are given. It is also recommended for exterior finish, to be used in connection with plaster and cement.

Chas. Croissant & Bro., 204 Washington avenue, Albany, N. Y., issue an illustrated price-list of Keller Patent Saw Set and Maas' Patent Refrigerator Fasteners. The Saw Sets are made in two sizes—No. 1 for Band, Scroll and all Hand Saws; No. 2 for all kinds of Cross Cut Saws.

Barnum Wire and Iron Works, Walkerville, Ont., manufacturers of Art, Wrought and Cast Iron, Brass, Bronze, Steel and Wire Work, issue an illustrated catalogue, No. 8, under date of April, 1890. We are advised that in the arrangement of the catalogue, which contains nearly 200 pages, the convenience of architects, builders and contractors was had in view. Attention is directed to their Sheet Metal Lath and a number of testimonials from contractors who have used it are given.

O. A. Bassett, Plainfield, Hartford County, Conn., issues a price-list illustrating fine Banjo and Drum Trimmings manufactured by him. It also shows a patent Lock Snap Dog Chain, the snap being locked with a key for security. These are made with single or double leads, with snap on one or both ends of the chain.

The E. Walker Tool Company, Erie, Pa., issue a circular illustrating the Walker's Adjustable Face Plane, Walker's Detachable Handle Chisels, Walker's Micrometer Surface and Marking Gauges and Walker's Cork Extractor.

The St. Louis Screw Company, St. Louis, Mo., issue an illustrated catalogue and price-list of Set, Cap and Machine Screws manufactured by them. We are advised that they are prepared to do all kinds of special milled work, and manufacture to order Screws and Bolts of any desired shape or sizes of Wrought or Malleable Iron, Brass or Steel. The point is made that all goods are manufactured of the very best material, and satisfaction guaranteed in every case.

The Branchville Ice Tool Works, Branchville, Conn., for whom George B. Gruman is agent, issue an illustrated price-list of Ice Tools manufactured by them. Attention is directed to their Elevated and Adjustable Hitch, causing the Plow to cut a uniform depth; also to their Patent Sulky Snow Scraper. This is described as convenient and a rapid worker, the entire control of the machine being in the hands of the operator, who is seated on the top.

The English Enamel Paint Company, 10 East Fifteenth street, New York, issue a circular of Griffith's English Enamel for

decorating and renovating. This Enamel is particularly adapted to artistic work for ladies. Sixty-three different colors of Enamel are shown, and can be used on Household Furniture, Garden Furniture, Cupboards, Doors, Venetian Blinds, Baskets, Flower Boxes, Pails, Water Cans, Mantelpieces, Trays, Picture Frames, Easels, Screens, &c. This enamel is put up in self-opening cans ready for use, and suggests very pleasant as well as useful work for ladies. The same company manufacture Cycle Enamel, Luster Liquid, Aquol, a non-poisonous paint; Spirit Stains, Paint Cleaner, Furniture Polish, Gold Paints, &c.

The Jersey City Smelting Works, 107 to 111 Plymouth street, Jersey City, N. J., send circulars and price-list of Electrical Specialties, Fuse-Wire, Wire Solder, Bab-bitt Metal, Aluminum, Sheer Wire, Ingots and Tubing, Bar Silver, Spelter and other Solders. They guarantee their Aluminum to be equal in quality to the best metal manufactured by any other process. They advise us they are prepared to furnish Aluminum Bronze Castings from 2 to 10 per cent. Aluminum.

The St. Louis Shovel Company, St. Louis, Mo., issue an 1890 illustrated catalogue and price-list of Shovels, Spades, Scoops and Drain Tools manufactured by them. The addition of their new plant is alluded to as giving a capacity for producing this line of goods which is second only to that of one other similar manufacturer, and the central location of their works is referred to as possessing great advantages to all buyers West, North and South, by reason of cheap rates of freight, quick deliveries and less damage to the goods in transit. They advise us that on and after July 1, 1890, they shall allow on all Scoops and Drain Tools a discount of 30 per cent. On all other plain back and back strap goods a discount of 20 and 7½ per cent. Goods f.o.b. St. Louis. Terms, 60 days' note or 2 per cent. discount for cash in 10 days.

The Hicks Lock Company, of Oshkosh, Wis., issue a very neat catalogue of their specialties. The Hicks Door Lock is cylindrical in shape and is attached to the door by boring a single hole with a standard size bit. The strike is also attached by boring a hole. Flat keys are used. The Hicks Cabinet Lock is fitted to place with only a screw driver and a standard size bit. The catalogue illustrates a number of different styles in which these Locks are made, and thoroughly explains their interior construction. A special Knob is also made, known as the Hicks Knob, which requires no screws to hold it in place.

The Wyeth Hardware and Mfg. Company, St. Joseph, Mo., jobbers and importers of Hardware, issue an illustrated fall catalogue and price-list of seasonable goods. Axes, Crosscut Saws, Lamps, Sleigh Bells, Silver Plated Ware, &c., are shown. An ingeniously arranged acrostic on the first page forms a complete business advertisement.

The Russell & Erwin Mfg. Company issue a large number of illustrated extra leaves, to be pasted into their catalogue, Vol. VII, representing new goods. They show Wrought Steel Rim Knob Locks, of new designs, ivory black finish, Rim Knob Latches and Rim Night Latches, all being of Wrought Steel. Also bronze and bronze plated Sliding Door Latches, real bronze Bell Pulls, japanned Padlocks, &c.

Horton, Gilmore, McWilliams & Co., 172 to 176 Lake street, Chicago, issue a 25-page fall circular, under date August, 1890, illustrating and giving prices of Axes, Wood Saws, Stove Boards, Coal Hods, Corn Huskers and other fall goods.

They inform the trade that they expect a large fall trade, that with a somewhat inflated currency, good crops and increasing prices for produce, it will be strange if there is not a large business and a general advance in prices before the year closes.

Hibbard, Spencer, Bartlett & Co., of Chicago, have issued a 36 page illustrated circular of seasonable goods. They exhibit a great variety of Corn Cutters, Husking Pins and Gloves, Hay Knives, Fruit Presses, Shovels and Forks, Grain Measures, Stove Boards, Elbows, Coal Hods, Coal Vases, Stove Shovels, Fire Irons and Stands, Umbrella Stands, Stove Trucks, Stove Polish, Door Bells, Door Hangers, &c., following which are miscellaneous goods, comprising Bit Braces, Saw Tools, Padlocks, Lapboards, Milk Strainers, Metallic Shingles, Coffee Mills, Twist Drills, Spectacles, Hanging Toilet Stands, Milk Kettles, Guns, Lamps, Carving Knives, Table Knives and Forks, Scissors, Wire Door Mats, &c. The circular is a very attractive one, well printed and handsomely illustrated, and is worthy of preservation for reference.

Items.

The Ross & Fuller Association, manufacturers' agents, 33 Chambers and 9 Reade streets, New York, have been appointed by C. G. Blum & Co., Collinsville, Ill., agent for the sale of their new Perfection Double Seamer. This article has been favorably known to the trade for some time as a desirable Roofing Tong, with valuable points to recommend it.

The Iowa Farming Tool Company, Fort Madison, Iowa, are placing on the market a Fulcrum or Brace, which they attach to a six-tine L or D handle common or plain ferrule Manure Fork for potato digging. They make the point that a six-tine Manure Fork is a handy tool with which to dig potatoes; it is growing in favor for this purpose, and this is especially true when their improved Fulcrum or Brace is attached, and with it more work can be done with less exertion than with a Hook or Spading Fork. The Fulcrum is light and strong and can be put on or taken off in half a minute.

The Senate reached the Cutlery paragraph of the Tariff bill on Tuesday, the 19th inst., without any changes being made except those recommended by the Finance Committee.

John Merry & Co., 535 to 547 West Fifteenth street, New York, have placed on the market a new brand of Roofing Plate which they term Merry's Old Method, every sheet stamped, squared and guaranteed. The above brand takes the place of Merry's Best. They also carry a full line of Galvanized and Black Sheet Iron, also Lamb & Ritchie's Corrugated Conductor Pipe and Spiral Leader Pipe of their own manufacture.

The Care of Price-Lists.*

BY C. T. ROSENTHAL, BATESVILLE, ARK.

The price-lists are to be placed in a case per accompanying illustration, Fig. 1. For convenience, the dimensions of pigeon holes are here given in detail, all inside measurements, viz.:

- | | |
|---------------|----------------------------|
| No. 1, | 28 in. wide, 13½ in. high. |
| No. 2, | 14 in. wide, 13½ in. high. |
| Nos. 3 & 4, | 13½ in. wide, 4 in. high. |
| No. 5, | 13½ in. wide, 4½ in. high. |
| No. 6, | 11½ in. wide, 4½ in. high. |
| No. 7, | 16 in. wide, 4½ in. high. |
| Nos. 8 to 25, | 9 in. wide, 4½ in. high. |

The case is 12 inches deep.

* This paper was awarded the Second Prize in Competition No. 1.

The receptacles may be made as pigeon holes or drawers, the latter being shown. The several pigeon holes and drawers are to be used as follows, as indicated in Fig. 1:

1. For Catalogues in large book form, such as Simmons Hardware Company, Shapleigh Hardware Company, Witte Hardware Company, Ripley & Bronson, Sargent & Co., Corbin, Paddock Hawley, &c., Ladd's Discount Book, &c.

2. *The Iron Age.*

3. *The Iron Age Hardware Bulletin.*

8 to 25. Select 18 (or more or less classes of goods best adapted to your business, and file each class in a drawer or pigeon hole. No. 8 to 25 to be each labeled with number and contents, as:

8. AXES & EDGE TOOLS.

The 18 classes for drawers 8 to 25 may be selected from the list below, although any other arrangement may be adopted. It will be advisable to arrange according to alphabet.

8. Axes and Edge Tools.



Fig. 1.—Case for Catalogues and Price-Lists.

4. Discount sheets for books in pigeon hole No. 1, and index, if any. (See below.)

5. To hold lists and mail matter relating to prices temporarily, until there is time to look over and put them in their proper places. To hold blank reference cards. (See below.)

6. Large catalogues asst., and such catalogues and price-lists as do not properly belong to any of the 18 classes mentioned below. (No. 8 to 25.)

7. Largest catalogues and lists not properly belonging to said 18 classes.

9. Belting, Hose and Rubber Goods.

10. Bits, Chisels and Carpenters' Tools.

11. Blinds, Doors and Sash.

12. Cornices, Galvanized Ironwork and Iron Roofing.

13. Cutlery, Butcher Knives, Shears and Spoons.

14. Glass and Glassware, Lamp Chimneys, &c.

15. Hardware, General.

16. Hardware, Heavy Wagon Material and Iron.

17. Hoes, Steel Goods, Snaths, &c.

18. Machinery.

19. Nails.
20. Paints and Oils.
21. Pipe, Steam Fittings and Pumps.
22. Plows, Plow Repairs, &c.
23. Stoves.
24. Tin, Tinware, &c., and Sheet Iron.
25. Wire and Wire Goods.

Discount sheets for books in pigeon holes are placed in No. 4, all others pasted on front fly leaf of list they belong to.

An index to be placed in pigeon hole 4 may be used, indexing the name of manufacturer or dealer, and number of pigeon hole where list may be found, thus:

Atkins, E. C. & Co.,	Saws, &c.,	15.
Avery, R. F. & Sons,	Plows, Cultivators, &c.,	22.
Athol Machine Co.,	Vises, Fine Tools, &c.,	15.
Adams & Westlake,	Stove Boards, Oil Stoves, &c.,	24.

The index is useful where there is a large number of lists; where this is not the case it is unnecessary.

2. If the shape of Case does not suit, same can be made wider or higher; in fact, it can be made almost any shape, retaining approximately the sizes of the pigeon holes.

3. If less than 18 classes are wanted, Case may be made lower and pigeon holes 20 to 25 or 23 to 25 left off.

4. If more than 18 classes are needed, Case can be made higher and 3, 6 or 9 pigeon holes of the size $4\frac{1}{2}$ by 9 be added, and numbered 26 to 28 or 26 to 31 or 26 to 34, as the case may be.

ADVANTAGES OF SYSTEM.

The advantage of this system is *saving of time and ease of reference*. Any person that has made himself familiar with this, can at once, without consulting index or any other preliminary steps turn to the literature he wants, and has also at the same time the different lists of other manufacturers and dealers of the same line of goods at hand.

Exports.

PER BARK BALDWIN, JULY 29, 1890. FOR WELLINGTON, NEW ZEALAND.

By McLean Bros. & Rigg.—9 dozen Axes, 6 dozen Saws, 12 dozen Hammers, 12 dozen Forks, 6 dozen Shears, 16 dozen Mouse Traps, 5 dozen Sash Cord, 12 dozen Rat Traps, 65 boxes Horse Nails, 10 dozen Axes, 1 Buggy, 10 dozen Axes, 4 dozen Meat Choppers, 30,000 Bolts, 2 Bone Grinders, 8 doz. Saws, 138 pounds Oil Stone, 3 dozen Wringers, 4 dozen Axes, 60 feet Garden Hose, 4 dozen Mattocks, 4 dozen Bush Hooks, 4 Lawn Mowers, 7 dozen Lamps, $\frac{1}{2}$ dozen Ladders, 23 Stoves, 3 Bells.

By H. W. Peabody & Co.—12 cases Edge Tools, 4 cases Rubber Goods, 53 packages Hardware, 7 gross Pencils, 5 packages Fly Traps, 14 pounds Nails, 26 cases Hardware, 600 pounds Horse Nails, 1 bundle and 45 cases Hardware, 1 case Hardware, 7 dozen Traps, 11 cases Hardware, 3 dozen Wringers, 12 dozen Wire Goods, 10 5-12 dozen Hardware, 25 cases Edge Tools, 100 pounds Nails, 5 cases Hardware, 1 dozen Wringers, 11 packages Hardware, 16 Wringers.

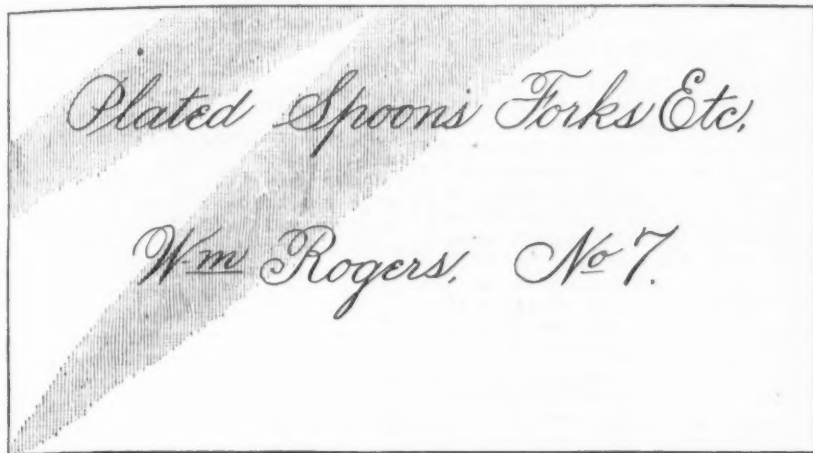


Fig. 2.—Reference Card.

Place books, catalogues, &c., in pigeon holes, as indicated above, marking the lists that go in pigeon holes No. 4 and No. 6 to 25 on one corner, with the number (number only) of pigeon hole where they belong.

All matter relating to prices, &c., received from time to time is to be treated in the same manner.

When lists, &c., are received when there is no time to assort, mark and place them in their proper places, lay them in pigeon hole No. 5, to be attended to when there is leisure.

When lists cannot be placed in their proper receptacle, on account of being too large, or for any other reason, use a reference card; for instance, Fig. 2, Wm. Rogers (Plated Ware), should go in No. 13, Cutlery, &c.; but as the book is 12 x 16 inches, put it in No. 7. At the same time take a reference card and write on it, as shown in Fig. 2, and put this card in No. 13.

For the same reason place catalogue of John Van & Co., Ranges, &c., in No. 7, and a reference card in "23, Stoves."

Lists (not books on shelf) that contain more than one class of goods will be placed in the pigeon hole adapted to the most important part of said list, and reference cards put in the other partitions referring to goods of said list.

Changes in list or discounts or any other information in *The Iron Age* is referred to in the same manner. For instance, *The Iron Age* January 2, 1890, has revised lists of Iron Nuts, Machine Bolts, &c. Take a reference card and mark as follows, Fig. 3, and place in pigeon hole 16, Heavy Hardware, &c. Sundries—i. e. goods that don't belong to any of the 18 classes mentioned, may be placed in Nos. 6 and 7.

Above is the arrangement of books, lists, &c. With very little care it will at all times be ready for service.

HOW TO USE THIS SYSTEM.

When wanting information turn to pigeon hole No. 1; if goods in question are found, get discount sheet from No. 4.

If this does not give all you want, turn to the proper class for lists, &c.; if this is

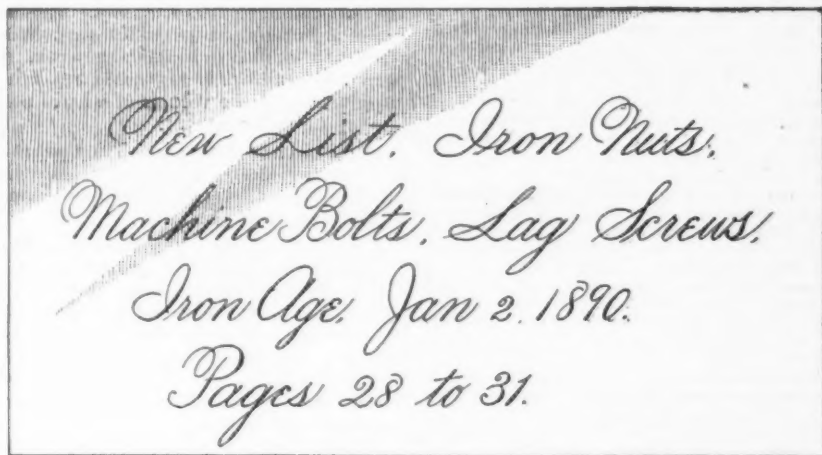


Fig. 3.—Reference Card to List in *Iron Age*.

not sufficient, the reference cards will indicate where further information may be had.

When through, replace lists, &c., to their proper places—large books and *The Iron Age* go in 1 and 2, all others are marked in corner with number of pigeon hole or drawer.

MODIFICATIONS OF SYSTEM.

The following changes may be made on above system, to suit different wants, viz.:

1. This Price-List Case may be made with door and lock.

By Arkell & Douglas.—10 dozen Hammers, 6 dozen Hoes, 1 gross Traps, 6 dozen Snaths, 6 dozen Forks, 4 dozen Wrenches, 336 pounds Nails, $1\frac{1}{2}$ dozen Pumps, 2 dozen Wringers, 1 gross Egg Beaters, 6 gross Fruit Jars, 14 dozen Axes, 10 dozen Saws, 530,000 Cart-ridges, 2 Bone Mills, 36 packages Hardware, 6 Shellers, 2 dozen Parers, 9 dozen Saws, 6 dozen Snaths.

FOR LYTTLETON.

By Coombs, Crosby & Eddy.—66 Blocks, 3 dozen Wrenches, 3 dozen Lamps, 23 $\frac{1}{2}$ dozen Tools.

By W. A. Wood.—536 packages Agricultural Implements.

By W. H. Crossman & Bro.—11 Lawn Mowers, 2 cases Hardware.

By Arkell & Douglas.—336 pounds Nails, 2800 pounds Nails.

By R. W. Forbes & Son.—3 cases Hardware, 10,000 Cartridges, 6 gross Pencils, 23 packages Hardware.

By H. W. Peabody & Co.—6 dozen Brushes, 13,000 Cartridges, 6 crates Churns, &c., 1 case Platedware, 14 packages Hardware, 3 packages Lampware, 12 gross Pencils, 2 dozen Wringers, 5 cases Edge Tools, 1 barrel Lampware, 1 dozen Wringers, 140 pounds Rivets, 1407 packages Agricultural Implements, 942 Barrels Binder Twine, 1 package Hardware, 1 case Skewers, 1 case Wireware, 3 cases Harvesting Machinery, 5 cases Hardware, 5 packages Lampware, 3 packages Hardware, 3 cases Wringers, 1 5-6 gross Brushes, 4 cases Enamel, 1 case Axes, 1 case Hardware.

PER BARK LIZZIE CURRY, JULY 29, 1890, FOR PORT NATAL, SOUTH AFRICA.

By Marcial & Co.—18 Saws, 4 dozen Hoes, 12 Scales, 24 dozen Axle Chips, 25 pounds Rivets, 5 pounds Bolts, 6 dozen Machinery Gauges, 2 gross Chisel Handles, 1 dozen Self Heating Irons, 4 pairs Springs, 17 pounds Malleable Castings, 1000 Bolts, 2 boxes Axes, 3 Wrenches, 10 cases Hatchets.

By Woodhouse & Stortz.—600 pounds Edge Tools.

By W. H. Crossman & Bro.—25 dozen Wheelbarrows, 30 dozen Carpenters' Hardware, 1 1/2 dozen Ladders, 50,000 pounds Barb Wire, 10 cases Carpenters' Hardware, 1 case Picture Cord, 1/2 dozen Carts, 3 cases Agricultural Implement Parts.

By Corner Bros. & Co.—1 case Ironware, 134 cases Agricultural Implements, 275 cases Builders' Hardware, 5 1/2 dozen Pumps, 33 cases Agricultural Implements, 26 cases Builders' Hardware.

By Coombs, Crosby & Eddy.—10 Scales, 80 Plows, 10,000 pounds Barb Wire, 3 dozen Hammers, 300 pounds Nails, 12 dozen Axes, 3 1/2 dozen Scales, 40,000 pounds Barb Wire, 3 dozen Meat Choppers, 10 Shellers, 20 dozen Spades, 13 Pumps, 31 cases Plows and Parts, 1/2 dozen Hand Carts, 1 dozen Wringers, 66 dozen Axes, 3 sets Axes, 26 dozen Axes, 1/2 dozen Corn Shellers, 1/2 dozen Hand Carts, 1 case Builders' Hardware, 1 Pump, 34 dozen Edge Tools, 50 Corn Shellers, 5500 pounds Nails, 103 cases Sash Weights.

PER BARK AINO, JULY 29, 1890, FOR BRISBANE, QUEENSLAND.

By V. Basanta.—6 dozen Enameled Plated Ware, 12 dozen Forks, 36 dozen Axle Grease, 12 Shellers, 3 dozen Sad Irons, 4 dozen Choppers, 12 Stoves, 6 dozen Wrenches, 6 Bells, 36 Shellers, 20 dozen Spades, 6 dozen Snaths, 1 1/2 dozen Choppers, 10 dozen Hammers, 18 dozen Glue, 6 dozen Locks, 2 dozen Grindstone Fittings, 100 dozen Lamp Goods, 12 dozen Cow Bells, 66 1/2 dozen Lamp Goods, 12 dozen Lamp Goods, 144 dozen Tacks.

By H. W. Peabody & Co.—56 packages Hardware, 1 bundle Lawn Sprinklers, 7 packages Plows, 48 crates Stoves, 16 packages Lawn Mowers, 15 Wringers, 28 packages Hardware, 1 set Stoves, 31 cases Lampware, 2 dozen Corn Shellers, 6 crates Cultivators, 5 cases Plows, 4 Seed Sowers, 24 packages Plows, 300 pounds Nails, 12 cases Wagons, 2 cases Hardware, 2 packages Carts, 10 cases Hardware, 1 case Stampedware, 19 packages Hardware, 13 packages Lawn Mowers, 1/2 dozen Carpet Sweepers, 1 case Stampedware, 6 dozen Mouse Traps, 2 boxes Tinware, 1 case Hardware, 3 cases Mower Parts, 2 cases Hardware, 6 cases Bolts, 2 cases Hardware, 5 crates Axes, 2 cases Wringers.

By Arkell & Douglas.—520 pounds Machine Tools, 12 dozen Irons, 10 dozen Lanterns, 20 dozen Axes, 10 dozen Shellers, 3 dozen Wrenches, 3 dozen Wrenches, 112 pounds Castings, 9 dozen Wrenches, 1 dozen Churns, 7 dozen Rakes, 3 dozen Emery Wheels, 112, 021 pounds Barb Wire, 48 Stoves, 20 Scales, 2 gross Pencils, 12 dozen Lanterns, 9 Lawn Mowers, 2 dozen Wringers, 15 dozen Axes, 6 dozen Bush Hooks, 3 dozen Saws, 1 dozen Corn Mills, 1 dozen Churns, 3 gross Reflectors, 10 gross Snaths, 6 sets Axes, 110 pounds Dies, 7 dozen Axes, 8 dozen Hammers, 336 pounds Nails, 3 dozen Pumps, 8 dozen Snaths, 34 Stoves, 6 Scales, 1 1/2 gross Axle Grease, 3 dozen Wrenches, 8 dozen Choppers, 12 dozen Stencils, 2 dozen Bench Screws, 1/2 dozen Wringers, 3 dozen Hoes, 44,867 pounds Barb Wire, 5 dozen Braces, 5 dozen Axes, 3 dozen Hammers.

By R. W. Forbes & Son.—1 case Forks, 1 case Tinware, 224 pounds Nails, 1 gross Mops, 200 Shells, 1 box Hardware, 193 feet Belting, 13 packages Hardware, 7 packages Fruit Jars, Oil Stoves, &c.

By A. S. Lascelles & Co.—1/2 dozen Hardware, 1/2 dozen Guns, 20,000 Cartridges.

By F. B. Wheeler Co.—8 dozen Hardware, 200 packages Hardware, 1 box Hardware.

By Hsley, Doubleday & Co.—4 1/2 gross Axle Grease.

By Mailler & Querean.—22,400 pounds Barb Wire, 11 cases Tools.

By Collins & Co.—25 dozen Handled Axes.
By Reed & Barton.—46 pounds Silver Plated-ware.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Jobbers have enjoyed a livelier week than is usually experienced at this season of the year. Low rates of freight consequent upon the sharp competition between the steamship lines, and cheap fares due to the same cause, have served to bring in a great many orders from various Southern points, besides attracting a large number of visitors from that quarter. This circumstance, in fact, has operated to set fall trade operations in motion sooner than usual, as far as the Southern interest is concerned. There has, however, been some evidence of rather more interest in other directions, and, while not what may be called active, the market has been characterized by greater animation than during any previous week within the past two months. Manufacturers of several lines of goods have also enjoyed a rather larger trade. Nothing has transpired in the way of important changes in values and there are no signs at present of any radical fluctuations in the immediate future on the more staple lines of goods.

White Lead.—The situation is wholly unchanged. Corrodors identified with the National Lead Trust do not appear to depart from the list established last June at all events, nor do the few outside manufacturers of pure pigment seem to have made any recent "cuts." As for the jobbers, they are following in the line of former policy, using the pigment as a "leader" chiefly, and supplying the retail trade at or under the card rates. Inferior Leads are without important change. With respect to business during the week, reports were uniformly favorable, reflecting improvement in the volume of sales of both pure and mixed pigment.

Red Lead and Litharge.—The market is bare of new feature. Prices remain the same as quoted heretofore, and the demand is of perfunctory character.

Zincs.—American Oxide is moving from first hands in moderate quantities only, yet the business passing appears to be in line with what is usual at this period of the year and prices are without important change. The jobbing distribution is fair. Foreign brands are firmly held, with Green Seal in strongest position and relatively higher than other brands.

Colors.—Some increase was noted in the distribution of house Painter's Colors, chiefly on orders placed by visiting buyers from the South and West, but including fair quantities on mail orders from other points. In Grinder's Colors there has been little or no movement outside of the ordinary routine. Prices vary in a narrow way only, and, as a whole, the market looks very steady.

Miscellaneous.—Block Chalk is without change, being offered at \$1.75 @ \$2, as to size of lot, with moderate sale. Whiting is also stationary as to value and moves fairly. Paris White is moving off in about the usual way at unchanged prices.

Oils and Turpentine.

There have been no striking developments in the market for animal or vegetable Oils. Exporters' operations have in-

volved little or nothing beyond ordinary quantities, nor have inquiries from that quarter been on a more extensive scale than during the preceding week. Home trade buyers have purchased somewhat more freely of crude Menhaden Oil, however, and rather larger buying of low grade Cotton Seed Oil by soapmakers is also noted, but in other lines the movement has involved little beyond the ordinary jobbing distribution. Very few and only slight changes in prices have taken place.

Linseed Oil.—The market for raw material has shown no change favorable to crushers, and cheaper Oil seems to be as far away as ever. The arrivals of outside brands also run light and are marked off at about 59¢. City brands, meanwhile, hold at 62¢ for domestic and 64¢ for Calcutta seed product, and are selling very fairly.

Cotton Seed Oils.—Few transactions in crude product have taken place during the week, and the little business effected was at barely steady prices. The lower grades of Summer Yellow have found fair sale at 31¢ @ 32 1/2¢, however, but prime quality at 34¢ @ 35¢ moves off slowly.

Lard Oil.—Prime present make Oil has ruled at 50¢, that price being the general one for both city and out of town brands. A rather larger business is reported, but individual purchases and inquiries still run almost wholly on small lots. Prime Winter has been sold at 52 1/2¢ for export.

Menhaden Oil.—About 1500 barrels of crude have been sold during the week at from 20¢ to 20 1/2¢ for dark up to 22¢ @ 22 1/2¢ for prime light. Supplies are coming forward somewhat irregularly, yet to a very fair total amount, and the market shows little, if any, improvement in tone.

Sperm and Whale Oils.—The position of the market for crude Oil is wholly unchanged and the manufactured products are moving at practically former figures, but rather slowly. Recent transactions in New Bedford include 240 barrels crude Sperm, recently landed, of heavy standard, reported at 63¢; 500-do. Ex. "Niger" at 65¢, and 1675 do. on private terms. The entire stock of Whale in first hands, 670 barrels, South Sea, was sold for manufacture on private terms.

Miscellaneous.—No change is visible in the position of the market for Coconut Oils and full previous prices are maintained. Olive Oil is rather slow and has been sold at easier prices. Palm Oil steady, but quiet, Red Oils having had slightly better movement at prices rather in buyers' favor.

Spirits Turpentine.—The movement has been rather slow, but prices are held with some steadiness despite that fact and the rather large supply. Latest sales at 40 1/2¢ @ 40 1/2¢ for regular and 41¢ for machine barrels.

Active operations have begun on the construction of the new Morrison double track bridge by the Chicago, Burlington and Quincy over the Mississippi at Burlington. The new structure will be 2015 feet long.

The Pottstown Iron Company, of Pottstown, Pa., have issued a neat little pamphlet relating to their products, steel billets, slabs, plates, nails, and phosphates.

Philadelphia real estate gained \$25,000,000 in value last year, according to the report of the Board of Tax Revision. The total valuation is \$710,600,000 as compared with \$535,800,000 ten years ago.

The men of Cooper, Hewitt & Co., Trenton, N. J., who struck some time since have returned to work at the firm's terms.

The Tidal Wave Gas and Oil Heating Stove.

The Coleman Hardware Company, 59 Dearborn street, Chicago, whose factories are at Morris, Ill., have made a new departure in their business. Perceiving the increasing use of gas for fuel purposes, and

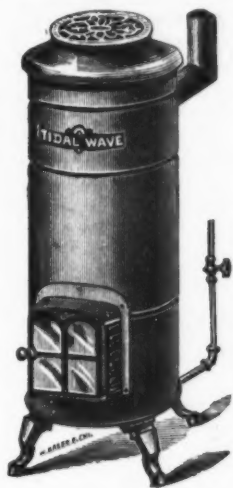


Fig. 1.—Exterior of Gas and Oil Stove.

possessing the manufacturing facilities requisite for the production of gas stoves, they have determined to enter that field. The first stove to be brought out by them is a heating stove of a wholly new design which will be known as the Tidal Wave Heater. Illustrations herewith given show the principle upon which it is constructed. Fig. 1 is an exterior view. Fig. 2 is a vertical cross section. Fig. 3 is a horizontal cross section above the base. Fig. 4 is a horizontal cross section at the top just below the smoke pipe. As shown in

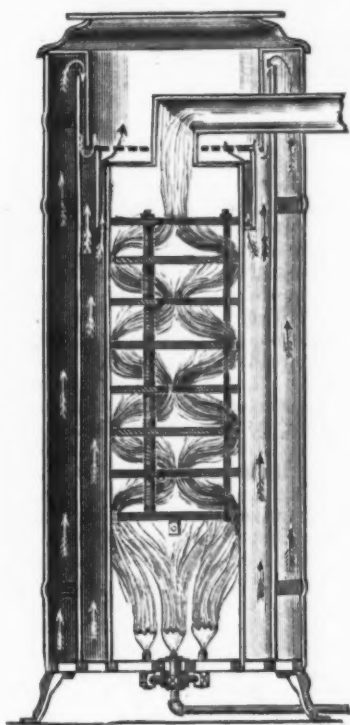


Fig. 2.—Vertical Cross Section of Stove.

Fig. 2, the stove is constructed with three cylinders, so that it has a combustion chamber in the center, which is completely surrounded by an air heating flue, and that again is surrounded by an exterior air flue. These chambers or flues are all open at the bottom to admit air at that point, and the arrows show the course of the air

currents. An enlarged chamber or flue is placed directly over the combustion chamber, communicating with the air heating flue and the exterior air flue by passages shown in the cut and discharging hot air into the room through openings at the top. The combustion chamber is provided with deflecting plates, which cause the flame and products of combustion to part with as much of their heat as can be secured before reaching the smoke pipe at the top. The pipe is intended to carry off to a chimney all odors, if there should happen to be imperfect combustion. It also answers another purpose—that of purifying the air of a room. Physicians have highly commended this stove for use in heating rooms for the sick on account of this feature in its construction. Pure air from outside, the room can easily be conducted to the bottom of the stove, if desired. This stove will be made with

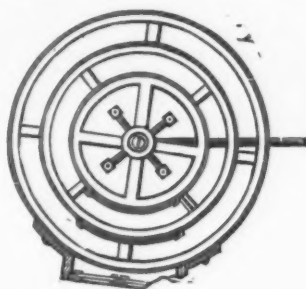


Fig. 3.—Horizontal Cross Section Above the Base.

either three or four burners, as desired. Fig. 2 shows three burners and Fig. 3 shows four burners in position. Fig. 1 shows a mica door in the outside casing, through which access is had to the burners. This door is hinged. The doors in the inner cylinders are arranged to slide. It will be perceived that this stove heats by circulation, which is the most healthful of all heat, and insures equal warmth in all parts of a room. By actual test, made recently, one of these stoves, burning but 12 feet of gas an hour, ran the mercury up to 264° at the top of the stove, and would light a match held 24 inches above the register. Three

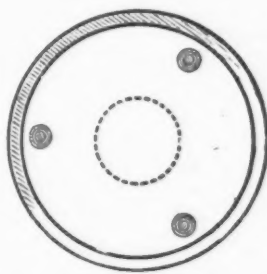


Fig. 4.—Horizontal Cross Section Just Below the Smoke Pipe.

sizes will be made, and each size will be finished in three different styles. The same stove is also intended to be adapted to use kerosene oil for heating. A center flame burner will be substituted for the gas burners, but in all other respects the stove will be identical in its construction and operation with the gas stove. From the very satisfactory results which have thus far been obtained, the company believe that they have a stove which they can fully warrant as an economical and efficient heater.

The regular monthly meeting of the Cast Iron Pipe and Pipe Fittings Manufacturers' Association was held at the Hotel Schlosser, Pittsburgh, on Tuesday, August

12. The attendance was fair, but no change was made in prices. The business transacted was chiefly of a routine character.

Best Yet Can Opener.

Hasbrouck Alliger, 125 Chambers street, is introducing the Best Yet Can Opener, as shown in the accompanying illustration.



Fig. 1.—Best Yet Can Opener, Preparing to Cut.

tions. It is described as being made of the best malleable iron, with steel blade. In operating the point is driven into the top of the can at or near its center, Fig. 1, the knife carrier being thrown upward until the stop engages the upper face of the bar, which causes the knife to virtually assume a perpendicular position. The knife is then forced downward into the top of the can near the edge, Fig. 2; the



Fig. 2.—Best Yet Can Opener in Operation

handle of the knife holder is pressed downward parallel with the handle of the body bar, and the top removed by carrying the two handles around in a circle. The advantages claimed over other can openers are, the knife is inclined at an angle in cutting; the cutter is canted downward, with the blade pointed forward. It is so shaped that the blade will not work up, and has no thumbscrew requiring both hands to adjust it, but fastens in the desired place by an automatic lock.

The Salem Foundry and Machine Shop, of Salem, Mass., manufacturers of freight elevators, are meeting with much success with their automatic self-locking safety gates for elevator openings. Among their recent sales may be noted the following: Pacific Mills, Lawrence; Everett Mills, Lawrence; Springfield Provision Company, Springfield; Lyman Mills, Holyoke; Overman Wheel Company, Chicopee Falls; Spartan Mills, Spartanburg, S. C.; Lynch-

burg Cotton Mills, Lynchburg, Va.; Sewall & Day Cordage Company, Boston; Chelsea Jute Mills, Brooklyn, N. Y.; Salem Building Association, Salem, and many others.

Revolving Book and Filing Case.

Curtis Goddard, Alliance, Ohio, is introducing two revolving cases, as illustrated herewith. Fig. 1 shows the book and show case, which is round, 42 inches high and 31 inches in diameter. The bent glass are double strength French, 12 x 28 inches. A sliding frame containing a glass makes the opening or door. The bottom and shelves revolve by the hand rail at the bottom and outside upon anti-friction cone shaped rollers. We are advised that the case may have all the weight on one side of the shelves without affecting the turning, as the rollers run close to the outside. The frame holding the glass is stationary and held by a steel tube in the center. The door always remaining in one place may be used from the back of a counter. They are referred to as having a fine finish and will correspond with the finest office, store or parlor furniture. The point is made that the case will hold more goods and occupy less space than any ordinary case, and show them to better advantage and protect them from dust or handling. The filing case, Fig. 2, is the same in construction as Fig. 1, but is arranged with 60 pigeon holes 5½ inches high, 4 inches wide and 12



Fig. 1.—Goddard's Revolving Book and Show Case.

inches deep. The shelves are grooved and the upright partitions are glass—both straight and bent glass being used. They are intended for filing price-lists, samples, unfinished papers, each article being plainly seen from any side, yet entirely separate, and to be used by superintendents, lawyers, managers, buyers and office men.

An ingenious invention is described in *Engineering* for distinguishing vessels in fogs. It is based on the fact that when a fog hovers over water there is always a clear space of a few feet between the surface of the water and the bottom layer of the fog. Each vessel is to be provided on one side of its bow, just above its highest water line, with a horizontal row of glazed port holes, and on the opposite side with a vertical row of like holes. Electric lights are arranged to throw beams of light forward and laterally through these

port holes, the different arrangement of which is to serve to show the course of the vessel.

A Year's Work.

S. R. Smythe & Laughlin Company, engineers and contractors, Pittsburgh, Pa., report that they and the two companies they succeeded—namely, the Swindell & Smythe Company and the Alex Laughlin Company—have built and placed in successful operation during the last year gas furnaces and gas producers at the following mills:

The Ramel Conley Iron and Steel Company, Brewsters, N. Y., complete open

King, Gilbert & Warner, Middleport, Ohio, four hole vertical soaking pit furnace. Oil City Tube Company, Oil City, one lap welding furnace.

They also report that they now have under contract and in course of erection \$150,000 worth of work, including four heating furnaces and eight gas producers for Fort Payne Rolling Mill, Fort Payne, Ala.; two rod mill heating furnaces and four gas producers for Baackes Wire Nail Company, Cleveland, Ohio; four circular gas producers for Cartwright, McCurdy & Co., Youngstown, Ohio, where they are also remodeling the heating furnaces; two 30-ton open hearth steel melting furnaces, one improved three hole soaking

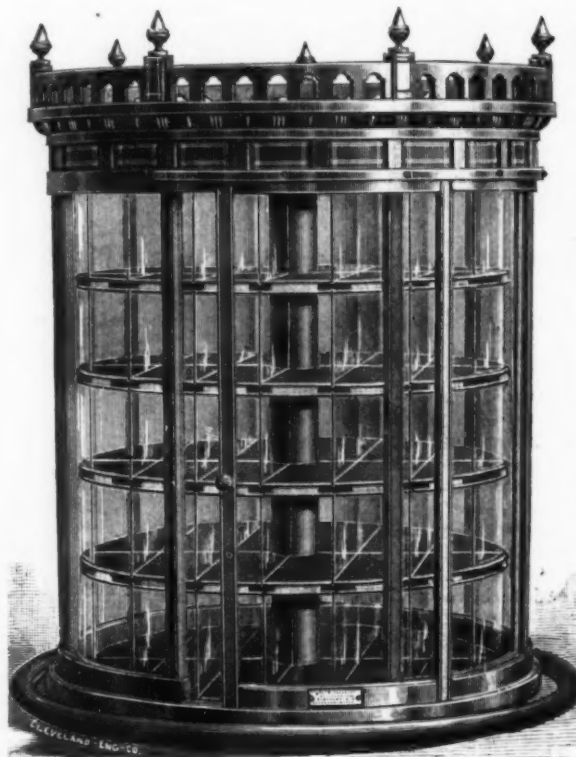


Fig. 2.—Goddard's Revolving Filing Case.

hearth steel plant, including furnace, producers, cranes, casting pit, ladles, &c.

Etna Iron and Steel Company, Bridgeport, Ohio, two heating furnaces with the necessary gas producers.

C. E. Rood, Lancaster, N. Y., two annealing furnaces.

Allegheny Bessemer Steel Company, four-hole vertical soaking pit furnace.

Paige Tube Company, Warren, Ohio, five bending welding and sockets, and the necessary gas producers.

Tyrone Iron Company, three heating furnaces and gas producers.

Syracuse Tube Company, Syracuse, N. Y., bending furnace.

Iowa Barb Wire Nail Company, Allentown, Pa., two large rod mill heating furnaces.

American Wire Nail Company, Anderson, Ind., two rod mill heating furnaces.

Riverside Iron Works, Wheeling, W. Va., improved gas producers of a novel design.

Laughlin and Junction Steel Company, Mingo Junction, Ohio, two circular gas producers.

Benjamin Atha & Co., Newark, N. J., one 15-ton open hearth steel melting furnace, two 30-pot crucible steel melting furnaces.

Greenfield Iron and Nail Company, Greenfield, Ind., gas heating furnace.

Cambridge Iron and Steel Company, Cambridge, Ohio, heating furnaces and gas producers.

pit furnace and 12 gas producers for Phoenix Iron Company, Phoenixville, Pa.; after these two open hearth furnaces are completed, they will make four furnaces in all. One welding and one bending furnace for Tyler Tube and Pipe Company, Washington, Pa.; one melting furnace and two annealing furnaces for C. E. Rood, Lancaster, N. Y.; one 24-pot crucible steel melting furnace for Hussey, Binns & Co., Charleroi, Pa.; one steel heating furnace for Macneale & Urban, Hamilton, Ohio; one guide mill heating furnace for the Illinois Steel Company, Milwaukee, Wis.; three heating furnaces torn down and rebuilt for Trumbull Iron Company, Warren, Ohio.

For the Pennsylvania Tube Company, Pittsburgh, they are putting in the largest gas plant ever built in this country for the purpose. They will abandon the use of natural gas entirely. Said plant consists of four lap welders, four benders, butt weld furnace, two bell furnaces, two socket furnaces and the necessary gas producers. For the Columbia Iron and Steel Company, Uniontown, Pa., two improved three hole soaking pit furnaces and one four hole soaking pit furnace and the necessary gas producers. For the Pennsylvania Construction Company, Uniontown, Pa., one 10-ton open hearth steel furnace for making steel castings.

The Chicago iron molders are reported to be in a state of ferment which may lead to labor troubles in that line. The cause

of the dissatisfaction is that San Francisco foundrymen have been sending patterns to Chicago for castings to be made on their account, the San Francisco molders being on a strike. One very prominent Chicago foundry was obliged to agree last week not to receive any more patterns from San Francisco until the dispute there is settled. According to the views of union men it is as disreputable to do anything on "struck" work as it would be to take the positions of the strikers.

The Andreen Fireproof Shutter.

Gustave Andreen, proprietor of the Omaha Safe and Iron Works, of Omaha, Neb., has invented a fireproof shutter

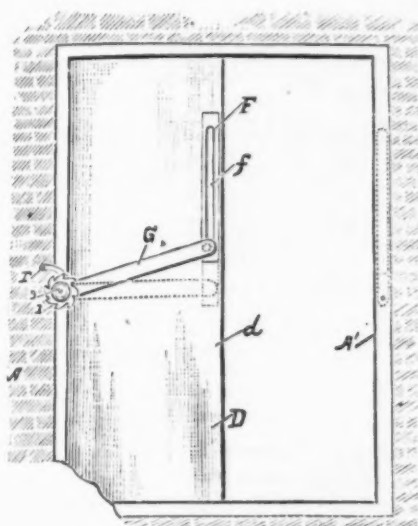


Fig. 1.—The Andreen Shutter, from the Inside of the Building.

which appears to have important advantages over those of the usual type. The Andreen shutter is hung on a track instead of hinges, and slides back and forth

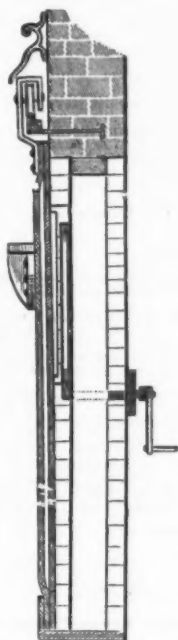


Fig. 2.—Vertical Section of the Andreen Shutter.

on the outside of the building. It is opened and closed from the inside, avoiding the necessity of raising and lowering windows, which is a great convenience in cold or stormy weather. Illustrations herewith given show how this

shutter is operated. Fig. 1 is a view from the inside of the building, and shows the construction of the shutter when it can slide both ways. It is locked by a ratchet wheel and pawl. Fig. 2 is a vertical section through the center of the win-

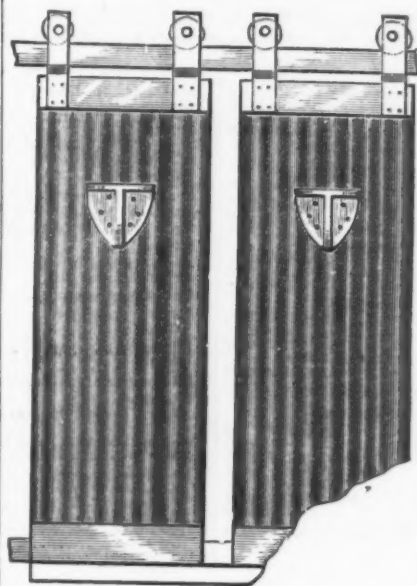


Fig. 3.—Outside View of the Andreen Shutters.

dow sash, and shows how the shutter is fastened to the building, as well as the crank which opens or shuts it from the inside. Fig. 3 is an outside view of a pair of these shutters. It has become necessary to construct fireproof shutters so that firemen can open them from the outside, especially on the upper stories, in case of conflagration. This can be done with the Andreen shutters, when the radius bar G, shown in Fig. 1, is arranged at an angle of 35°. The fireman can then stand on his ladder and partially or fully open the shutters, or they can be opened or closed from the ground with water pressure from the hose directed against the bucket on the shutters, shown in Fig. 2. These features are highly commended by fire marshals and others in testimonials received by Mr. Andreen and published in pamphlet form. The shutters are made of corrugated iron or with a flat iron plate inside and a corrugated sheet on the outside. Ingenious adaptations of this shutter have been made to cover cases in which the windows are much wider than the walls separating them. The shutters are then constructed in sections running on more than one track.

A part of the plant of the Hazard Wire Rope Works, in Wilksbarre, Pa., was demolished by a tornado on Tuesday afternoon. One boy was killed and 13 men severely injured. Superintendent Gaskins reported that they would be in running order again in about one week.

It has been estimated by the engineer officers of the army that \$60,000,000 will be needed to fortify and arm all the harbors of importance on the coast, and that \$25,000,000 will be needed for the heavy guns and emplacements necessary for a defense of New York, Philadelphia, Boston and Baltimore. It does not appear to be the policy of the Government to establish gun foundries, wherein the work will be performed wholly by Government officials, but rather gun factories, where the heavy forgings may be received from private establishments, then worked over in the Government factory and the ma-

chined parts of the gun assembled. In this way it is hoped to create a sort of dependency of the Government on the country.

The Western Society of Civil Engineers contemplate the holding of an international congress of civil engineers in connection with the World's Fair at Chicago. A committee of the Western Society appointed to consider the question recommends that the engineering societies of other countries be asked to send delegates, and that the governments of the world should send representatives. It was proposed that delegates from the engineering societies of this country and Canada should meet in Chicago about October 1 of this year for the purpose of formulating plans for holding an international congress.

The Norfolk and Western Railroad Company have issued a neat little illustrated book descriptive of the cities and industries along their line.

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CURRENT HARDWARE PRICES.

AUGUST 20, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Adjusters, Blind.

Domestic.....\$ dos \$3.00, 33¢
Excelsior.....\$ dos \$10.00, 60¢
Washburn's Self-Locking.....20¢

Ammunition.—

Caps, Percussion, 1000—
Nicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34¢
E. B. Trimmer Edge, 1-10's.....46¢
E. B. Grad. Edge, Cent. Fire, 1-10's.....46¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢
Eley's D Waterproof, Central Fire.....\$1.60

Cartridges—

Rim Fire Cartridges.....50¢
Rim Fire Military.....15¢
Cent. Fire, Pistol and Rifle.....25¢
Cent. Fire, Military and Sporting.....15¢
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., \$1.75.....2¢
Blank Cartridges, 32 cal., \$3.50.....2¢
Primed Shells and Bullets.....15¢
B. B. Caps, Round Ball, \$1.75.....2¢
B. B. Caps, Con. Ball, Swd., \$2.00.....2¢

Primers—

Berdan Primers, \$1.00.....3¢
B. L. Caps (for Sturtevant Shells) \$1.00.....3¢
All other Primers, \$1.20.....3¢

Shells—

First quality 4, 8, 10 and 12 gauge.....25¢
First quality, 14, 16 and 20 gauge (\$10 list).....30¢
Prise.....40¢
Star, Club, Rival and Climax brands.....39¢
Selbold's Comb. Shot Shells.....15¢
Brass Shot Shells, 1st quality.....60¢
Brass Shot Shells, Club, Rival, Climax.....65¢

Shells Loaded—

Standard List, July 19, 1890.....40¢
Wads—Price per M.
U. M. C. & W. R. A.—E. E., 11 up.....68¢
U. M. C. & W. R. A.—E. E., \$10.....82¢
U. M. C. & W. R. A.—E. E., 9¢.....94¢
U. M. C. & W. R. A.—E. E., 7¢.....\$1.10
U. M. C. & W. R. A.—P. E., 11 up.....1.15
U. M. C. & W. R. A.—P. E., \$10.....1.50
U. M. C. & W. R. A.—P. E., 9¢.....1.70
U. M. C. & W. R. A.—P. E., 7¢.....1.80
Eley's B. E., 11 up.....\$1.75
Eley's P. E., 11 up.....2.80

Anvils—

Eagle Anvils, \$10.....15¢
Peter Wright's.....10¢
Armstrong's Mouse Hole.....10¢
Armstrong's Mouse Hole, Extra.....11¢
Trenton.....10¢
Wilkinson's.....10¢
J. & Riley Carr, Pat. Solid.....11¢
Moore & Barnes Mfg. Co.....33¢
Anvil Vise and Drill—
Millers Falls Co., \$18.00.....30¢
Cheney Anvil and Vise.....25¢
Allen Anvil and Vise, \$3.00.....40¢
Star.....45¢

Apple Parers—See Parers, Apple.

Augers and Bits—

Douglas Mfg. Co.....70¢
Wm. A. Ives & Co.....70¢
Humphreysville Mfg. Co.....70¢
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.).....70¢
Rockford Bit Company.....70¢
Cook's, Douglas Mfg. Co.....55¢
Cook's, N. H. Copper Co. 50¢
Ives' Circular Lip.....80¢
Patent Solid Head.....80¢
C. E. Jennings & Co., No. 10, extension lip.....40¢
C. E. Jennings & Co., No. 30.....60¢
C. E. Jennings & Co., Auger Bits, 1 set, 32¢ quarter, No. 5, 8, No. 30, \$3.50, 20¢
Lewis' Patent Single Twist.....45¢
Russell Jennings' Augers and Bits.....45¢
Imitation Jennings' Bits.....60¢
Snell's Jennings Pattern.....60¢
Fugle's Black.....20¢
Rockford, Jennings' Pattern.....60¢
Car Bits, P. S. & W. Co.....60¢
Car Bits, P. S. & W. Co.....60¢
Snell's Car Bits.....60¢
L. Hommedieu Car Bits.....15¢
Forster's Pat. Auger Bits.....10¢
Cincinnati Bell-Frangiers' Bits.....30¢

Bit Stock Drills—

Morse Twist Drills.....50¢
Standard.....50¢
Cleveland.....50¢
Syracuse, for metal.....50¢
Syracuse, for wood (wood list).....50¢
Williams' or Holt's, for metal.....50¢
Williams' or Holt's, for wood.....50¢
Cincinnati, for wood.....50¢
Cincinnati, for metal.....45¢

Expansive Bits—

Clark's small, \$18; large, \$26.....35¢
Ives' No. 4, \$ dos \$60.....40¢
Swan's.....40¢
Ives' No. 1, \$26; No. 2, \$22.....35¢
Ives' No. 3, \$48.....30¢

Gimlet Bits—

common.....\$ gross \$2.75 @ \$3.25
Diamond.....\$ dos \$1.10.....25¢
Bee.....25¢
Double Cut Shephardson's.....45¢

Double Cut, Ct. Valley Mfg. Co.....30¢
Double Cut, Hartwell's, \$ gro.....\$5.25
Double Cut, Douglas.....40¢
Double Cut, Ives.....60¢

Hollow Augers—

Ives.....33¢
French, Swift & Co.....33¢
Bonney's Adjustable, \$ dos \$48.....40¢
Stearns.....20¢
Ives' Expansive, each \$4.50.....50¢
Universal Expansive, each \$4.50.....20¢
Wood's.....25¢
Cincinnati Adjustable.....25¢
Cincinnati Standard.....25¢

Ship Augers and Bits—

L. Hommedieu's.....15¢
Watrous.....15¢
Snell's.....15¢
Snell's Ship Auger Pat'n Car Bits.....15¢

Awl Hafts—See Hafts, Awl.

Awls, Brad Sets, &c—

Awls, Sewing, Common \$ gr \$1.70, 35¢
Awls, Should, Peg, \$ gr \$2.45, 40¢
Awls, Pat. Peg, \$ gr \$3.....40¢
Awls, Shouldered Brad, 2.70 \$ gr.....35¢
Awls, Handled Brad, \$7.50 \$ gr.....45¢
Awls, Handled Scratch \$ gr, \$7.50, 35¢
Awls, Socket Scratch, \$ dos, \$1.50, 25¢
Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality.....Plain. Beveled. \$8.00
Others.....7.50
Note.—Jobbers often sell at lower prices than the above.

Axle Grease—See Grease, Axle.

Axles—

No. 1, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 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Chucks.
Beach Pat. each, \$3.00, 20%
Horse's Adjustable, each, \$7.00, 30%
Danbury, each, \$6.00, 30%
Syracuse, each, \$5.00, 30%
Skinner's Patent Chucks, 35%
Combination Lathe Chucks, 40%
Universal Lathe Chucks, 40%
Independent Lathe Chucks, 40%
Drill Chucks, 15%
Union Mfg. Co., \$8.50, 25%
Victor, 40%
Combination, 40%
Universal, 40%
Independent, 40%

Churns.
Tiffin Union No. 1, 5 gallon, \$3.25 each
Tiffin Union No. 2, 7 gallon, \$3.75 each
Tiffin Union No. 3, 10 gallon, \$4.25 each

Clamps.
R. L. Tool Co.'s Wrought Iron, 25%
Adjustable, Cincinnati, 15%
Adjustable, Hammers, 15%
Adjustable, Stearn's, 30%
Stearns' Adjustable Cabinet and Corner, 30%
Cabinet, Sargent's, 60%
Carriage Makers', Sargent's, 70%
Carriage Makers', P. S. & W. Co., 40%
Eberhard Mfg. Co., 40%
Warner's, 40%
Saw Clamps, see Vises, Saw Filers.
Carpenters', Cincinnati, 25%
Cleavers.
Butchers', 25%
Bradley's, 25%
L. & J. White, 40%
Beatty's, 40%
New Haven Edge Tool Co., 40%
P. S. & W. Co., 40%
Foster Bros., 40%
Schulte, Lohoff & Co., 40%

Clips.
Norway, Axle, 4 & 5-16, 55%
2nd grade Norway Axle, 4 & 5-16, 65%
Superior Axle Clips, 60%
Norway Spring Bar Clips, 5-16, 60%
Wrought Iron Felloe Clips, 5-16, 55%
Steel Felloe Clips, 5-16, 55%
Baker Axle Clips, 5-16, 55%

Cloth and Netting, Wire.—See Wire, &c.

Cockeyes......60%

Cocks, Brass.

Hardware list......50%
Coffee Mills.—See Mills, Coffee.

Collars, Dog, &c.
Medford Fancy Goods Co., 40%
Embossed, Gift, Pope & Steven's list, 30%
Leather, Pope & Steven's list, 40%
Brass, Pope & Steven's list, 40%
Chapman Mfg. Company, 50%
Combs, Curry.
Fitch's, 50%
Rubber, per doz \$10.00, 20%
Perfect, 50%

Compasses, Dividers, &c.
Compasses, Calipers, Dividers, 70%
Bemis & Call Co.'s
Dividers, 60%
Compasses & Calipers, 50%
Wing and Inside or Outside, 50%
Double, 60%
(Call's Pat. Inside), 30%
Excelsior, 50%
J. Stevens & Co.'s, 25%
Stearns'
Spring Calipers and Dividers, 25%
Lock Calipers and Dividers, 25%
Combination Dividers, 25%

Coopers' Tools.—See Tools, Coopers'.

Cord, Sash.
Common, 10%
Patent, good quality, 10%
White Cotton Braided, fair, 25%
Common Russia Sash, 10%
Patent, 15%
Cable Laid Italian Sash, 25%
Indian Cable Laid, 25%
Silver Lake—
A Quality, White, 50%
A Quality, Drab, 50%
B Quality, White, 30%
B Quality, Drab, 30%
C Quality, White only, 20%
Sylvan Spring, Extra Braided, White, 34%
Sylvan Spring, Extra Braided, Drab, 30%
Semper Idem, Braided, White, 30%
Egyptian, India Hemp, Braided, 25%
Samson—
Braided, White Cotton, 50%
Braided, Drab Cotton, 50%
Braided, Italian Hemp, 50%
Braided, Linen, 30%

Corkscrews.—See Screws, Cork.

Corn Knives and Cutters.—See Knives, Corn.

Crackers, Nut.
Table (H. & B. Mfg. Co.), 40%
Blake's Pattern, 40%
Turner & Seymour Mfg. Co., 50%

Cradles.
Grain, 50%

Crayons.
White Crayons, 12%
D. M. Stewart Mfg. Co., Metal Workers, 25%
M. Stewart Mfg. Co., Rolling Mill, 25%
See also Chalk.

Crow Bars.—See Bars, Crow.

Curry Combs.—See Combs, Curry.

Curtain Pins.—See Pins, Curtain.

Cutters.

Meat.
Dixon's # doz, 40%
Nos. 1 2 3 4 5
\$14.00 \$17.00 \$10.00 \$0.00
Woodruff's # doz, 40%
Nos. 1 2 3 4 5
\$15.00 \$18.00
Hales Pattern # doz, 70%
Nos. 1 2 3 4 5
\$57.00 \$35.00 \$45.00
American, 30%
Nos. 1 2 3 4 5
Each, \$5 \$7 \$10 \$35 \$50 \$80
Enterprise, 30%
Nos. 1 2 3 4 5
\$25.00 \$25.00 \$25.00 \$25.00 \$25.00
Great American Meat Cutter, 30%
Nos. 1 2 3 4 5
Each, \$2.00 \$2.75 \$3.00 \$2.50 \$4.00
Miles' Challenge # doz, 45%
Nos. 1 2 3 4 5
\$22.00 \$30.00 \$40.00
Home No. 1, 40%
Draw Cut, each, \$26.00, 55%
Nos. 5 6 7 8
\$50 \$75 \$80 \$225 20%
Great American, 30%
Beef Shavers (Enterprise), 20%
Little Giant, 30%
Chadborn's Smoked Beef Cutter, 50%
Tobacco.
Champion, 20%
Wood Bottom, 20%
All Iron, 20%
Nashua Lock Co.'s, 50%
Wilson's, 55%
Sargent's, 55%
Acme, 40%
Washer.
Smith's Pat. # doz \$12.00, 20%
Penny's # doz \$11.00, 30%
Appleton's, 40%
Bonney's, 30%
Cincinnati, 25%

Cutlery.

Beaver Falls & Booth's, 35%
Wostenholme, \$7.75 to 25%

Dampers, &c.

Dampers, Buffalo, 40%
Buffalo Damper Clips, 40%
Crown Damper, 40%
Excelsior, 40%

Diggers, Post Hole, &c.

Samson Post Hole Digger, 30%
Fletcher Post Hole Augers, 30%
Eureka Diggers, 30%
Leed's, 30%
Vaughan's Post Hole Auger, 30%
Kohler's Little Giant, 30%
Kohler's Hercules, 30%
Kohler's New Champion, 30%
Schneider, 30%
Ryan's Post Hole Diggers, 30%
Cronk's Post Hole, 30%
Gibbs Post Hole Digger, 30%
Imperial, 30%

Dividers.

See Compasses.

Dog Collars.—See Collars, Dog, &c.**Door Springs.**—See Springs, Door.**Drawers.**

Money, # doz, \$18.25 to 30%

Drawing Knives.—See Knives, Drawing.**Drills and Drill Stocks.**

Blacksmith's, each \$1.75
Blacksmith's Self-Feeding, each \$7.50, 20%
Breast, P. S. & W., 40%
Breast, Wilson's, 40%
Breast, Miller Falls, each \$2.50, 25%
Breast, Bartholomew's, 25%
Ratchet, Merrill's, 20%
Ratchet, Ingersoll's, 25%
Ratchet, Parker's, 20%
Ratchet, Whitney's, 20%
Ratchet, Moore's, 20%
Ratchet, Curtis & Curtis, 30%
Whitney's Hand Drill, Plain, \$11.00, 20%
Adjustable, \$12.00, 20%
Wilson's Drill Stocks, 10%
Automatic Boring Tools, \$1.75 to \$1.85
Morse, 50%
Standard, 50%
Syracuse (Metal list), 50%
Cleveland, 50%
Williams, 50%
New Process, 50%

Drill Bits.—See Augers and Bits.**Drill Chucks.**—See Chucks.**Dripping Pans.**—See Pans, Dripping.**Drivers, Screw.**

Douglas Mfg. Co., 20%
Dixson's, 40%
Buck Bros., 30%
Stanley R. & L. Co.'s
Furnished Handles, 65%
Black Handles, 60%
Sargent & Co.'s
No. 1 Forged Blade, 60%
Nos. 20, 30 and 60, 60%
P. S. & W., 70%
Knapp & Cowles No. 1, 60%
No. 1 Extra, 60%
Nos. 90 & 4, 60%
Stearns', 25%
Gay & Parsons, 30%
Champion, 25%
Clark's Pat., 30%
Crawford's Adjustable, 30%
Ellrich's Socket and Ratchet, 25%
Allard's Spiral, new list, 25%
Kolb's Common Sense # doz \$5.00, 25%
Syracuse Screw-Driver Bits, 30%
Screw-Driver Bits, # doz, 50%

Screw-Driver Bits, Parr's, # doz \$6.25
Fray's Hol. Hdl. Seta. No. 3, \$12.00, 25%
P. D. & Co.'s all Steel, 50%
Cincinnati, 25%
Brace Screw Drivers, 25%
Buck Bros' Screw-Driver Bits, 5%

Egg Beaters.—See Beaters, Egg.**Egg Poachers.**—See Poachers, Egg.**Electric Bell Sets.**—See Bells, Electric.**Emery.**—No. 4 to No. 54 to Flour CP

40 gr. 150 gr. P. FF.
Kegs, # b, 4 5 6 7 8 9 10
1/2 kegs, # b, 4 5 6 7 8 9 10
1/4 kegs, # b, 4 5 6 7 8 9 10
10-b cans, 10
10-b cans, 10
than 10, 10 10 10 10 10 10 10

Framed and Tinned Ware.—See Ware, Hollow.**Escutcheon Pins.**—See Pins, Escutcheon.**Escutcheons.**

Door Lock, Same dis as Door Locks.
Brass Thread, 60%
Wood, 25%

Expanded Metal.

List No. 5.
Lathing, 10%
Fencing, Painted Sheets, 20%
Netting, Painted Sheets, 20%
Door Mats, Galvanized, 25%
Window Guards, Paneled, 15%
Tree Guards, Paneled, 15%

Fasteners, Blind.

Mackrell's, # doz, \$1.00, 20%
Van Sand's Screw Pat., \$15 # gr., 60%
Van Sand's Old Pat., \$15.00 # gr., 60%
Washburn's Old Pattern, # gr., 60%
Merriman's, new list
Austin & Eddy No. 2008 # gr., 40%
Security Gravity, # gr., 60%

Faucets.

Fenn's, 40%
Bohren's Pat. Rubber Ball, 25%
Fenn's Cork Stops, 30%
Star, 60%
Frary's Pat. Petroleum, 40%
B. & L. B. Co.

West's Lock, Open and Shut Key, 50%
Star, Metal Plug, new list, 40%
Lockport, Metal Plug, reduced list, 60%
Metallic Key, Leather Lined, 60%
Cork Lined, 70%
Burnside's Red Cedar, 50%
Burnside's Red Cedar, bbl lots, 50%
John Sommers'

Peerless Best Block Tin Key, 40%
IXL, 1st quality, Cork Lined, 50%
Diamond Lock, 40%
Perfection, Fla. Red Cedar, 50%
Goodenough Cedar, 50%
Boss Metallic Key, 50%
Reliable Cork Lined, 60%
Western Pattern Cork Lined, 60%

Self-Measuring
Enterprise, # doz \$50.00, 20%
Lane's, # doz \$36.00, 25%
Victor, # doz \$36.00, 25%

Felloe Plates.—See Plates, Felloe.**Fifth Wheels.**

Derby and Cincinnati, 45%
Brewster, 50%

Files.

Domestic—
Nicholson Files, Rasps, &c., 60%
Nicholson (X. F.) Files, 25%
Nicholson's Royal Files (Seconds), 75%
Other makers, best brands, 60%
Fair brands, 60%
Second quality, 70%
Nicholson's Horse Rasps, 60%
Heller's Horse Rasps, 50%
McCaffrey's Horse Rasps, 50%
Chelsea Horse Rasps, Hand Cut, 50%
Moses & Gamble, List, April 1, 1883, 15%
Butcher's, 30%
Turton's, 20%
Greaves' Horse Rasps, American list, 60%

Fixtures.

Grindstone—
Sargent's Patent, 70%
Reading Hardware Co., 30%
P. S. & W. Co., 60%

Fluting Machines.—See Machines, Fluting.**Fluting Scissors.**—See Scissors, Fluting.**Fodder Squeezers.**—See Squeezers, Fodder.**Forks.**

Hay, Manure, &c., A&A List, 70%
Hay, Manure, &c., Phila. List, 60%
Plated, see Spoons.

Frames.

Saw—
White Vermont, # gr \$9.00 to \$10.00
Red, Polished and Varnished, # doz \$1.50, 25%

Screen, Window and Door.

Porter's Pat. Window and Door Frame, 35%
Warner's Screen Corner Irons, 35%
Stearns' Frames and Corners, 25%

Freezers, Ice Cream.

White Mountain, 60%
Granite State, 65%
Arctic, 70%
Buffalo Champion, 65%
Shepard's Lightning, 65%

Gem, 65%
Blizzard, 70%
Double Action Crown, 60%
Crown, 60%
Star, 60%
Peerless and Giant, 60%
Zero and Pet, 65%
Boss, 65%
Keystone, P. D. & Co., each, \$1.50, 20%

Fruit and Jelly Presses.—See Presses, Fruit and Jelly.**Fry Pans.**—See Pans, Fry.**Funnels.**

Gersdorff's Perfection, Standard and Globe, 7 1/2, 1 gro., 10 1/2, 2 to 5 gro., 20 1/2, 5 to 10 gro., 30 1/2, 10 to 20 gro., 15 1/2, 5 to 12 doz., 20 1/2, over 12 doz., 30 1/2

Fuse.—\$1000 ft

Common Hemp Fuse, for dry ground, 2.25
Common Cotton Fuse, for dry ground, 2.25
Single Taped Fuse, for wet ground, 4.85
Double Taped Fuse, for very wet gr., 5.60
Triple Taped Fuse, for very wet gr., 7.50
Small Gutta Percha Fuse, for water, 7.50
Large Gutta Percha Fuse, for water, 12.00

Gates, Molasses.

Stebbin's Pattern, 75%
Stebbin's Genuine, 60%
Stebbin's Tinned Ends, 40%
Chase's Hard Metal, 50%
Bush's, 20%
Lincoln's Pattern, 70%
Weed's, 30%
Boss, # doz, No. 1, #2; No. 2, #3; No. 3, #4; No. 4, #10, 60%

Gauges.

Marking, Mortise, &c., 60%
Starrett's Surface, Center and Scratch, 25%
Wire, low list, 10%
Wire, Wheeler, Madden & Co., 10%
Wire, Morse's, 60%
Wire, Brown & Sharpe's, 10%
Wire, P. S. & W. Co., 10%

Gimlets.

Nail and Spike, 60%
Eureka's Gimlets, 40%
"Diamond" Gimlets, \$ gr \$5.00
Double Cut, Shepardson's, 45%
Double Cut, Ives', 60%
Double Cut, Douglass', 40%
"Bee," # gr \$12, 25%

Glue.

Le Page's Liquid, 25%
Upton's Liquid, 25%
Le Page & Co.'s Improved Process, 25%

Glue Pots.—See Pots, Glue.**Grease, Axle.**

Fraser's, # Keg # b 4 #, Pail # b 5 #
Fraser's, in boxes, # gr \$9.50
Dixon's Everlasting, in bxs., \$ gr \$2.00
Dixon's Everlasting, 10-b pails, ea. 35¢
Lower grades, special brands, \$ gr \$5.50 to \$7.00

Grindstones.

Small, at factory, \$ ton \$7.50 to \$9.00

Grindstone Fixtures.—See Fixtures, Grindstone.**Hack Saws.**—See Saws.**Hafts, Awl.**

Sewmg, Brass Per. # gr \$3.50, 45%
Pat. Sewing, Short, \$1.00 # doz, 40%
Pat. Sewing, Long, # doz \$1.20
Pat. Peg, Plain Top, # gr \$10.00, 45%
Pat. Peg, Leather Top, # gr \$12.00, 45%

Halters.

Covert's, Rope, 1/4-in. Jute, 50%
Covert's, Rope, 1/4-in. Hemp, 50%
Covert's Adj. Rope Halters, 40%
Covert's Hemp Horse and Cattle Tie, 50%
Covert's Jute Horse and Cattle Tie, 60%
Covert's Adj. Web Halters, 35%

Hammers.

Handled Hammers—
Maydole's, list Dec. 1, '85, 25%
Buffalo Hammer Co., 50%
Humason & Beckley, 50%
Atha Tool Co., 50%
Fayette R. Plumb, 50%
C. Hammond & Son, 50%
Hartford Hammer Co., 50%
Verre, 50%
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75, 30%
Nelson Tool Works, 40%
Warner & Nobles, 30%
Peck, Stow & Wilcox, 30%
Sargent's, 30%
Heavy Hammers and Sledge—
3 lb and under, # b 40¢
3 to 5 lb, # b 30¢
Over 5 lb, # b 30¢
Wilkinson's Smiths, 10%

Handcuffs and Leg Irons.—See Police Goods.**Handles.**

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, # pair, 25¢; No. 3, 15¢; No. 6, 16¢; No. 2 and No. 4, Revivable, 15¢
Boynton's Loop Saw Handles, 50%
Champion, 15%

Iron, Wrought or Cast.

Door or Thumb, Nos. 0 1 2 3
Per doz., \$0.90 1.00 1.18 1.35 1.50
60% to 12 19

Shepard Hand Fluter, No. 110 # dos 40¢
 \$11.00
 Shepard Hand Fluter, No. 65 # dos 40¢
 \$8.50
 Clark's Hand Fluter, # dos \$15.00, 35¢
 Combined Fluter and Sad Iron, # dos \$10.00, 30¢
 Buffalo # dos \$10.00, 10¢

Hoisting—
 Moore's Hand Hoist, with Lock 30¢
 Brake 20¢
 Moore's Differential Pulley Block 40¢
 Energy Mfg. Co.'s 25¢

Mallets.
 Hickory 20¢10¢20¢10¢10¢
 Hickory and Side, List Jan. 1, 1888, 60¢25¢
 Livin' 20¢10¢20¢10¢10¢
 B. & L. Block Co., Hickory & L. V. 30¢20¢10¢
 Mallets, Regular List 60¢10¢

Measures—
 Standard Fiberware, No. 1, peck, # dozen, \$4; 1/4 peck, \$3.50.
Meat Cutters—See Cutters, Meat.

Mills.
 Coffee—
 Box and Side, List Jan. 1, 1888, 60¢25¢
 American Enterprise Mfg. Co. 30¢10¢30¢
 The Swift, Lane Bros. 20¢10¢

Mining Knives—See Knives, Mining.
Malasses Gates—See Gates, Malasses.

Money Drawers—See Drawers, Money.

Mowers, Lawn.
 Leading makers 60¢60¢10¢5¢
 Other makers 60¢10¢5¢60¢10¢10¢
 Pennycuill's 60¢
 Continental 60¢
 New Model 60¢10¢5¢
 New Quaker City 60¢10¢5¢
 Great American 60¢10¢5¢

Muzzles—
 Safety # dos \$3.00, 25¢

Nails.
 Cut and Wire. See Trade Report.
 Wire Nails, Papered.
 Association List, July 15, '89, 75¢75¢5¢
 Tack Mfrs.' List 60¢10¢10¢
 Wire Nails, Standard Penny
 Card June 1, '89, base \$2.50 @ \$2.60

Nose—
 Nos. 6 7 8 9 10
 Available 25¢ 20¢ 25¢ 24¢ 23¢
 Clinton, Fin. 40¢5¢2¢
 Essex 25¢ 20¢ 25¢ 24¢ 23¢
 Lyra 25¢ 20¢ 25¢ 24¢ 23¢
 Snowden 25¢ 20¢ 25¢ 24¢ 23¢
 Putnam 25¢ 20¢ 25¢ 24¢ 23¢
 Vulcan 25¢ 20¢ 25¢ 24¢ 23¢
 Northwest 25¢ 20¢ 25¢ 24¢ 23¢
 Globe 25¢ 20¢ 25¢ 24¢ 23¢
 Boston 25¢ 20¢ 25¢ 24¢ 23¢
 A. C. 25¢ 20¢ 25¢ 24¢ 23¢
 O. B. K. 25¢ 20¢ 25¢ 24¢ 23¢
 Champion 25¢ 20¢ 25¢ 24¢ 23¢
 New Haven 25¢ 20¢ 25¢ 24¢ 23¢
 Saranac 25¢ 20¢ 25¢ 24¢ 23¢
 Champion 25¢ 20¢ 25¢ 24¢ 23¢
 Capewell 25¢ 20¢ 25¢ 24¢ 23¢
 Star 25¢ 20¢ 25¢ 24¢ 23¢
 Anchor 25¢ 20¢ 25¢ 24¢ 23¢
 Western 25¢ 20¢ 25¢ 24¢ 23¢
 Empire Bronzed 25¢ 20¢ 25¢ 24¢ 23¢

Picture—
 Brass Head, Sargent's list 50¢10¢10¢
 Brass Head, Combination list 50¢10¢10¢
 Porcelain Head, Sargent's list 50¢10¢10¢
 Porcelain Head, Combination list 40¢10¢10¢
 Niles' Patent 40¢

Nail Pullers—See Pullers, Nail.
Nail Sets—See Sets, Nail.

Not Crackers—See Crackers, Nut.

Nuts—
 Nuts, off list Dec. 18, 1889: Square, Hex, Hot Pressed, 6.10¢ 6.00¢
 Cold Punched 6.10¢ 6.00¢
 In lots less than 100 lb, # 2, add 1/4¢; 1-b boxes, add 1¢ to list.

Oakum—
 Government # 7 @ 7 1/4¢
 U. S. Navy # 6 @ 6 1/4¢
 Navy # 5 @ 5 1/4¢

Oilers—
 Zinc and Tin 65¢65¢10¢
 Brass and Copper 50¢10¢10¢5¢
 Malleable, Hammer, Improved, No. 1 \$3.00; No. 2, \$4.00; No. 3, \$4.40 # dos 10¢10¢5¢
 Malleable, Hammer, Old Pattern, same list 40¢
 Prior's Pat. or "Paragon" Zinc 60¢10¢10¢
 Prior's Pat. or "Paragon" Brass 50¢
 Olmstead's Tin and Zinc 60¢
 Olmstead's Brass and Copper 50¢
 Broughton's Zinc 60¢
 Broughton's Brass 50¢
 Gem P. D. & Co. # gro. \$2
 Steel, Draper and Williams 50¢

Openers, Can.
 Messenger's Comet # dos \$3.00, 35¢
 American # gro. \$3.00
 Duplex # dos 25¢ 15¢20¢
 Lyman's # dos \$3.75, 30¢
 No. 4 French # dos \$2.25, 55¢60¢
 No. 5, Iron Handle # gr \$6.00, 45¢50¢
 Eureka # dos \$2.50, 10¢
 Sardine Scissors # dos \$2.75 @ 3¢
 Star # dos \$2.75
 Sprague, No. 1, \$2.00, 2, \$2.35, 3, \$2.75
 Excelsior, No. 1, \$2.50; No. 2, \$1.57...40¢

World's Best, # gross, No. 1, \$12.00
 No. 2, \$24.00; No. 3, \$36.00...50¢10¢
 Universal, # dos \$3.00...35¢5¢
 Domestic, # dos \$2.50...1¢
 Champion, # dos \$2.00...1¢

Packing, Steam—
 Rubber—
 Standard 60¢25¢65¢
 Extra 50¢50¢25¢
 N. Y. B. & P. Co., Standard 40¢10¢50¢
 N. Y. B. & P. Co., Empire 60¢5¢65¢
 N. Y. B. & P. Co., Salamander # 35¢, 10¢15¢
 Jenkins' Standard # 80¢...25¢5¢

Miscellaneous—
 American Packing 10¢11¢
 Russia Packing 13¢14¢
 Italian Packing 13¢14¢
 Cotton Packing 15¢17¢
 Lute 7¢8¢

Padlocks—See Locks.

Pails.
 Galvanized Iron—
 Quarts 10 12 14
 Hill's Light Weight, # dos \$2.75 3.00 3.25
 Hill's Heavy Weight, # dos 3.00 3.25 3.75
 Whiting's 2.75 3.00 3.25
 Sidney Shepard & Co. 2.35 2.85 3.05
 Iron Clad 2.50 2.75 3.00
 Fire Buckets 2.75 3.25 3.50
 Buckets, see Well Buckets.

Indurated Fibre Ware—25¢
 Star Pails, 12 qt # dos \$6.00
 Fire, Stable and Milk, 14 qt # dos \$7.80
Standard Fibre Ware—
 Plain. Dec'd
 Water Pails, 12 qt, per dos \$4.00 \$4.50
 Dairy Pails, 14 qt, per dos 4.50 5.00
 Fire Pails, No. 1, 12 qt, per dos 4.50 5.00
 Sugar Pails 6.00 6.50
 Horse Pails 5.00 5.50
 Buggy Pails 4.00 4.50
 Slop Jars (bal. trap) 8.00 9.00
 Chamber Pails, 14 qt 6.50 7.50

Pans.
 Dripping.
 Small tins # dos 6 1/4¢
 Large sizes # dos 5 1/4¢

Fry—
 Standard List:
 No. 0 1 2 3 4
 # dos \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
 No. 5 6 7 8 9
 # dos \$6.00 \$7.00 \$8.00 \$9.00
 Polished, regular goods 70¢10¢
 Acme Fry Pans 60¢10¢

Paper and Cloth—
 Sand and Emery—
 List April 19, 1886 50¢50¢10¢
 Sibley's Emery and Crocus Cloth 30¢

Parers.
 Apple.
 Advance # dos \$4.75
 Baldwin # dos 5.25
 Bonanza # each 5.00
 Champion # dos 7.25
 Daisy # dos 4.00
 Dandy # each 7.50
 Eureka 1888 # each 10.00
 Family Bay State # dos 12.00
 Favorite # dos 5.00
 Gem # dos 5.25
 Gold Medal # dos 4.00
 Ideal # dos 4.00
 Improved Bay State # dos \$7.00 @ 30.00
 Little State # dos 4.50
 Monarch # dos 13.50
 New Lightning # dos 5.50
 Oriole # dos 4.00
 Penn # dos 4.00
 Perfection # dos 4.00
 Rocking Table # dos 6.00
 Turntable # dos 4.50
 Viceroy # dos 13.50
 Viceroy # dos 4.00
 White Mountain # dos 4.00
 72 # dos 4.35
 78 # dos 5.75
 78 # dos 6.50

Pencil—
 Faber's Carpenters' # high list 50¢
 Faber's Round Gilt # gro \$5.25
 Dixon's Lead # gro \$4.50
 Dixon's Lumber # gro \$6.75
 Dixon's Carpenters' 40¢10¢

Picks—
 Railroad or Adze Eye, 5 to 6, \$12.00;
 6 to 7, \$13.00...60¢10¢

Picture Nails—See Nails, Picture.

Pinking Irons—See Irons, Pinking.

Pins.
 Bow—
 Humason, Beckley & Co.'s 60¢10¢
 Sargent & Co.'s #17 and #18 60¢10¢
 Peck, Stow & W. Co. 50¢10¢50¢10¢

Curtain—
 Silvered Glass # net
 White Enamel # net
Escutcheon.
 Iron, list Nov. 11, 1885 50¢10¢50¢10¢5¢
 Brass 60¢60¢25¢

Pipe, Wrought Iron—
 List September 18, 1889.
 1 1/2 and under, Plain 47¢
 1 1/2 and under, Galvanized 40¢
 1 1/2 and over, Plain 65¢
 1 1/2 and over, Galvanized 47¢
 Boiler Tubes, Iron.
 1 1/2 and under 45¢
 2 to 4 inch 50¢
 4-inch and larger 52¢

Planes and Plane Irons—
 Wood Planes—
 Molding 40¢25¢
 Joint First Quality 55¢25¢
 Bench, Second Quality 60¢25¢
 Bailey's (Stanley R. & L. Co.) 40¢10¢

Iron Planes—
 Bailey's (Stanley R. & L. Co.) 40¢10¢40¢10¢10¢
 Miscellaneous Planes (Stanley R. & L. Co.) 20¢10¢20¢10¢10¢
 Victor Planes (Stanley R. & L. Co.) 20¢10¢20¢10¢10¢

Steer's Iron Planes.
 Verlen Mail Iron Co.'s 40¢40¢10¢
 Davis' Mail Planes 40¢40¢10¢
 Birmingham Plane Co. 50¢50¢10¢
 Case Tool Co.'s Self-Setting 20¢10¢10¢
 Chaplin's Iron Planes 40¢40¢10¢
 Sargent's 30¢10¢30¢10¢10¢
 Standard Tool Co. 50¢50¢5¢

Plane Irons—
 Butler's 35.00 @ \$5.25 to 2
 Buck Bros 30¢
 Auburn 35¢
 Ohio 35¢25¢
 Sandusky 25¢
 S. & J. White 25¢

Plates.
 Felice # 4¢ @ 6 1/4¢

Pliers and Nippers—
 Button's Patent 50¢50¢10¢
 Hall's No. 2, 5 in., \$13.50; No. 4, 7 in. \$21.00 # dos 20¢10¢30¢45¢
 Humason & Beckley Mfg. Co. 50¢50¢10¢
 Gas Pliers 60¢5¢
 Eureka Pliers and Nippers 40¢
 Russell's Parallel 25¢
 P. S. & W. Cast Steel 50¢
 P. S. & W. Tinnars' Cutting Nippers add 6¢ dia 10¢

Carew's Pat. Wire Cutters. 20¢
 Morrill's Parallel, # dos \$12.00 30¢5¢
 Cronk's 8 in., \$15.00; 10 in. \$21.00 40¢40¢5¢

Plumbs and Levels—
 Regular List 70¢10¢70¢10¢10¢
 Diaston's 50¢
 Pocket Levels 70¢10¢70¢10¢10¢
 Davis' Iron Levels 30¢
 Davis' Incliniometers 10¢10¢

Poachers.
 Egg.
 Buffalo Steam Egg Poachers, # dos, No. 1, \$6.00; No. 2, \$9.00 25¢

Pokes, Animal—
 Bishop's I. X. L. # dos \$6.00
 Bishop's O. K. # dos \$5.25
 Bishop's Pioneer # dos \$3.75
 Bishop's American # dos \$2.75
 Double Stale # dos \$5.75
 Eagle, Single Stale # dos \$3.75
 Buckeye, Single Stale # dos \$2.75

Police Goods.
 R. I. Tool Co., Handcuffs, \$15.00 # dos 10¢
 R. I. Tool Co., Leg Irons, \$25.00 # dos 10¢
 Tower's 25¢
 Daley's Improved Handcuffs: 2 Hands, Polished, # dos \$48.00; Nicked, \$57.00; 3 Hands, Polished, # dos \$72.00; Nicked, \$84.00...25¢
 J. P. Lovell's Police Goods 25¢

Polish, Metal.
 Prestoline 30¢
 Prestoline Paste 33¢
 Gaston's Silver Compound 33¢

Polish, Stove.
 Joseph Dixon's # gro \$6.00, 10¢
 Gem # gro \$4.50, 10¢
 Gold Medal # gro \$5.00, 25¢
 Mirror # gro \$6.00, 10¢
 Lustral # gro \$4.75
 Ruby # gro \$3.75
 Rising Sun, 5 gro lots # gro \$5.50
 Dixon's Plumbago # 8¢
 Boynton's Moon Day, # gro 13.00
 Parlor Stove Enamel # gro 3 cans Yates' Liquid 2 3 1 gal. 8¢
 Yates' gal. \$0.90 80 70 60
 Yates Standard Paste Polish, 10-b cans, # 15¢
 Jet Black # gro \$3.50
 Japanese # gro \$3.50
 Fireside # gro \$2.50
 Diamond O. K. Enamel # gro \$19.00
 Bonnell's Liquid Stove Polish # gro \$9.00
 Bonnell's Paste Stove Polish # gro \$6.00
 Black Eagle Benzine Paste, 5 and 10 lb cans 12¢
 Black Jack Water Paste, 5 and 10 lb cans 12¢
 Nickel Plate Paste # gro \$6.00

Peppers, Corn.
 Round or Square, 1 qt. # gr \$10.00 @ 10.50
 Round or Square, 1 1/2 qt. # gr \$15.00 @ 15.50
 Round or Square, 2 qt. # gr \$18.50 @ 19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
 Glue—
 Tinned 40¢
 Enamelled 40¢8¢
 Family, Howe's "Eureka" 40¢
 Family, L. F. C.'s "Handy" 50¢

Presses.
 Fruit and Jelly—
 Enterprise Mfg. Co. 20¢10¢30¢
 Hens 5¢
 Shepard's Queen City 40¢

Pruning Hooks and Shears—
 See Shears.

Pullers.
 Nail.
 Curtis Hammer # dos \$9.00
 Giant, No. 1 # dos \$13.00, 10¢
 Giant, No. 2 # dos \$15.00, 10¢
 Pelican # dos \$9.00, 25¢

Pullers—
 Hot House, Awning, &c. 60¢10¢
 Japanned Screw 60¢10¢
 Brass Screw 60¢10¢
 Japanned Clothes Line 60¢10¢
 Empire Sash Pulley 55¢60¢
 Moore's Sash, Anti-Friction 50¢
 Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50 50¢10¢50¢10¢25¢
 Hay Fork, "Anti-Friction," 5 in. Solid, \$5.70 50¢
 Hay Fork, "P" Common and Pat. Bushed 20¢
 Hay Fork, Tarbox Pat. Iron 20¢
 Hay Fork, Reed's Self-Lubricating 60¢
 Shackle Block 45¢
 Moore's Anti-Friction's in. Wheel, # dos \$12.00 40

Pumps—
 Cistern, Best Makers 60¢60¢10¢
 Pitcher Spout, Best Makers 57¢70¢
 Pitcher Spout, Cheaper Goods 70¢70¢5¢

Punches—
 Saddlers' or Drive, good, # dos 60¢65¢
 Bemis & Call Co.'s Cast Steel Drive 50¢5¢
 Bemis & Call Co.'s Springfield Socket 50¢5¢
 Spring, good quality # dos \$5.50 @ 2.00
 Spring, Leach's Pat. 15¢
 Bemis & Call Co.'s Spring and Check 40¢
 Solid Tinnars' P.S. & W. Co. # dos \$1.44, 55¢
 Tin's Hollow Punches P.S. & W. Co. 20¢25¢
 Rice Hand Punches 15¢
 Avery's Revolving 40¢
 Avery's Saw-Set and Punch. See Saw Sets.

Rail—
 Sliding Door, Wrt Brass # 35¢...15¢
 Sliding Door, Bronzed Wrt Iron # ft. 7¢
 Sliding Door, Iron, Painted, # foot 4¢, 40¢
 Barn Door Light In. 3¢ 3¢ 4¢
 Per 100 feet \$2.10 2.50 3.10, 10¢
 R. D. for N. E. Hangers

Small, Med. Large.
 Per 100 feet \$2.15 2.70 3.25...net

**Terry's Steel Rail, # foot 50¢25¢
 Victor Track Rail, # foot 50¢25¢
 Carrier Steel Rail, # foot 45¢
 Moore's Wrought Iron 25¢**

Rakes—
 Cast Steel, Association goods 70¢
 Cast Steel, outside goods 60¢10¢10¢70¢5¢
 Malleable 70¢70¢5¢
 Gibbs Lawn Rake 12¢.00, 50¢15¢
 Canton Lawn Rake 50¢.00, 60¢10¢
 Ft. Madison Prize Bow Brace and Peers 65¢
 Fort Madison Steel Tooth Lawn Rake 60¢.00...25¢

Razor.
 J. R. Torrey Razor Co. 60¢10¢10¢70¢5¢
 Wostenholme and Butcher, \$10.00 to 2. 10¢
 Jordan's A.A.A. list Nov. 1, 1889 50¢
 Jordan's Old Faithful, list Nov. 1, '89 50¢
 Electric List net

Razor Straps—See Straps, Razor.

Rings and Ringers.
 Bull Rings—
 Union Nut Co. 65¢
 Sargent's 60¢10¢10¢70¢5¢
 Hotchkiss' low list 70¢42¢
 Humason, Beckley & Co.'s 70¢42¢
 Peck, Stow & W. Co.'s 50¢10¢50¢10¢10¢
 Elrich Hdw. Co., White Metal, low list 50¢50¢10¢

Hog—
 Top of the Hill Ringers # dos \$2.00
 Top of the Hill Ringers # dos \$1.25
 Hill's Improved Ringers # dos \$1.25
 Hill's Old Style Ringers # dos \$2.75
 Hill's Tongs # dos \$4.50
 Hill's Rings # dos bxs \$2.15 @ 2.25
 Perfect Ringers # dos bxs \$1.00 @ 1.70
 Perfect Ringers # dos \$2.15 @ 2.25
 Blair's Hog Ringers # dos \$2.50 @ 2.50
 Blair's Hog Rings # dos 99¢ @ 1.00
 Champion Ringers # dos \$2.00
 Champion Rings, Double # dos \$2.25
 Brown's Ringers # dos \$2.00
 Brown's Rings # dos \$1.25 @ 1.30

Rivets and Bars—
 Iron, list Nov. 17, '87 40¢
 Copper 50¢10¢
 Coppered Iron, Betina Brand 40¢

Rivet Sets—See Sets.

Rods—
 Star, Brass 25¢25¢
 Stair, Black Walnut # dos 40¢

Rollers—
 Barn Door, Sargent's list 60¢10¢10¢
 Acme Moore's Anti-Friction 55¢
 Union Barn Door Roller 70¢

Rope—
 Manufacturers' prices:
 Manila 1/4 in. and larger # 15¢
 Manila 1/2 in. # 15¢
 Manila 3/4 in. # 15¢
 Manila 1 in. # 15¢
 Manila 1 1/4 in. # 15¢
 Manila 1 1/2 in. # 15¢
 Sial 1/4 inch and larger # 12¢
 Sial 1/2 in. # 12¢
 Sial 3/4 in. # 12¢
 Sial 1 in. # 12¢
 Sial 1 1/4 in. # 12¢
 Sial 1 1/2 in. # 12¢
 Sial Medium Lath Yarn # 11¢
 Cotton Rope # 15¢18¢ net
 Jute Rope # 7¢4¢

Wire—
 List May 1, 1886 33¢42¢44¢
 Iron, Galvanized 40¢25¢
 Cast Steel 40¢25¢

Rules—
 Boxwood 80¢10¢10¢50¢10¢10¢5¢
 Ivory 50¢50¢10¢
 Starrett's Rules and Straight Edges 25¢10¢

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sausage Stuffers or Fillers—
 See Stuffers or Fillers, Sausage.

Saws—
 Diaston's Circular 45¢
 Diaston's Cross Cuts 45¢
 Diaston's Hand 20¢
 Woodrough & W. Parlin 25¢
 Hand, Panel and Rip 25¢
 Narrow Champion Cross Cuts with Handles, # foot 20¢
 Champion Thin Back Cross Cuts, # foot 25¢
 Champion Extra Thin Back Cross Cuts, # foot 31¢
 One Man Champion Cross Cuts, # foot 40¢
 Wheeler, Madden & Clemson Mfg. Co. Hand, Panel and Rip 30¢
 Narrow Champion Cross Cuts with Handles, # foot 20¢
 Champion Thin Back Cross Cuts, # foot 25¢
 Champion Extra Thin Back Cross Cuts, # foot 31¢
 One Man Champion Cross Cuts, # ft. 40¢

Atkins' Circular Shingle and Heading..... \$5.50, 10%
Atkins' Silver Steel Diamond X Cuts..... \$10.00, 10%
Atkins' Special Steel Dexter X Cuts..... \$10.00, 10%
Atkins' Special Steel Diamond X Cuts..... \$10.00, 10%
Atkins' Champion and Electric Tooth X Cuts..... \$10.00, 10%
Atkins' Hollow Back X Cuts..... \$10.00, 10%
Atkins' Mulay, Mill and Drag..... \$10.00, 10%
Atkins' One-Man Saw, with handles..... \$10.00, 10%
Peace Circular and Mill..... \$10.00, 10%
Peace Hand and Panel and Rip..... \$10.00, 10%
Peace Cross Cuts..... \$10.00, 10%
Richardson's Circular and Mill..... \$10.00, 10%
Richardson's X Cuts..... \$10.00, 10%
Richardson's Hand, &c..... \$10.00, 10%
Hack Saws—
Griffin's, complete..... \$10.00, 10%
Griffin's Hack Saw, Blades..... \$10.00, 10%
Star Hack Saws and Blades..... \$10.00, 10%
Eureka and Crescent..... \$10.00, 10%
Scroll—
Lester, complete, \$10.00..... \$10.00, 10%
Rogers, complete, \$4.00..... \$4.00, 10%
Barner's Builders' and Cabinet Makers' \$15..... \$15.00, 10%
Barner's Scroll Saw Blades..... \$15.00, 10%
Saw Frames—See Frames, Saw.
Saw Sets—See Sets, Saw.
Saw Tools—See Tools, Saw.
Scales—
Hatch, Counter, No. 171, good quality..... \$21.00
Hatch, Tea, No. 161..... \$21.00
Union Platform, Plain..... \$21.00
Chattillon's Grocers' Trip Scales..... \$21.00
Chattillon's Eureka..... \$21.00
Chattillon's Favorite..... \$21.00
Family, Turnbills..... \$21.00
Rieble Bros' Platform..... \$21.00
Scale Beams—See Beams, Scale.
Scissors, Fluting..... \$21.00
Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) \$6.50..... \$6.50, 10%
Box, Handmade..... \$6.50, 10%
Box, 2 Handle..... \$6.50, 10%
Defiance Box and Ship..... \$6.50, 10%
Foot..... \$6.50, 10%
Ship, Common..... \$6.50, 10%
Ship, R. I. Tool Co..... \$6.50, 10%
Screen Window and Door Frames—See Frames.
Screw Drivers—See Drivers, Screw.
Screws—
Bench and Hand—
Bench, Iron..... \$5.50, 10%
Bench, Wood, Beech..... \$5.50, 10%
Bench, Wood, Hickory..... \$5.50, 10%
Hand, Wood..... \$5.50, 10%
Lag, Blunt Point, list Jan. 1, 1890, 75¢ per 100..... \$75.00
Coach and Lag, Gimlet Point, list Jan. 1, 1890..... \$75.00
Bed..... \$25.00
Hand Rail, Sargent's..... \$25.00
Hand Rail, H. & B. Mfg. Co..... \$25.00
Hand Rail, Am. Screw Co..... \$25.00
Jack Screws, Millers Falls list..... \$50.00
Jack Screws, P. S. & W..... \$50.00
Jack Screws, Sargent's..... \$50.00
Jack Screws, Stearns..... \$50.00
Cork—
Humason & Beckley Mfg. Co..... \$40.00
Willamson's..... \$35.00
Howe Bros & Hulbert..... \$35.00
Machine—
Flat Head, Iron..... \$55.00
Round Head, Iron..... \$55.00
Wood—
List March 1, 1890..... \$55.00
Flat Head Iron..... \$55.00
Round Head Iron..... \$55.00
Flat Head Brass..... \$55.00
Round Head Brass..... \$55.00
Flat Head Bronze..... \$55.00
Round Head Bronze..... \$55.00
Rogers' Drive Screws..... \$55.00
Scroll Saws—See Saws, Scroll.
Scythe Snaths—See Snaths, Scythe.
Sets.
Avi and Tool.
Alken's Sets, Awls and Tools..... \$55.00
No. 20, \$12.00..... \$12.00
Fray's Adj. Tool Rids., No. 1, \$12.25; No. 2, \$12.50..... \$12.25
S. 12; 4, \$9..... \$9.00
Miller's Falls Adj. Tool Rids..... \$25.00
No. 1, \$2.25; No. 2, \$1.80..... \$2.25
Brad Sets..... \$2.25
No. 42, \$10.50; No. 43, \$12.50; No. 44, \$10.50
Stanley's Excelsior..... \$10.50
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50..... \$7.50
Nail—
Square..... \$4.00
Round..... \$4.25
Buck Bros..... \$4.25
Cannon's Diamond Point..... \$4.25
Rivet.
Regular list..... \$50.00
Saw—
Stillman's Genuine..... \$5.00
Stillman's Imita..... \$3.25
Common Lever..... \$2.00
Morrill's No. 1, \$15.00; No. 2, \$12.00; No. 3, \$10.00; No. 4, \$8.00; No. 5, \$6.00; No. 6, \$5.00; No. 7, \$4.00; No. 8, \$3.00; No. 9, \$2.00; No. 10, \$1.50; No. 11, \$1.00; No. 12, \$0.75; No. 13, \$0.50; No. 14, \$0.35; No. 15, \$0.25; No. 16, \$0.15; No. 17, \$0.10; No. 18, \$0.05; No. 19, \$0.03; No. 20, \$0.01
Hammer, Hotchkiss..... \$5.50, 10%
Hammer, Bemis & Call Co's new Pat..... \$5.50, 10%
Bemis & Call Co's Lever and Spring Hammer..... \$5.50, 10%
Bemis & Call Co's Plate..... \$5.50, 10%
Bemis & Call Co's Cross Cut..... \$5.50, 10%
Alken's Genuine..... \$13.00, 60¢
Alken's Imitation..... \$7.00, 55¢
Hart's Pat. Lever..... \$2.50
Dillon's Star..... \$2.50
Leopold..... \$40.00, 50¢
Atkin's Lever..... \$10.00, 10%
Atkin's Criterion..... \$10.00, 10%
Croissant (Keller), No. 1, \$15.00; No. 2, \$10.00; No. 3, \$8.00; No. 4, \$6.00; No. 5, \$4.00; No. 6, \$3.00; No. 7, \$2.00; No. 8, \$1.50; No. 9, \$1.00; No. 10, \$0.75; No. 11, \$0.50; No. 12, \$0.35; No. 13, \$0.25; No. 14, \$0.15; No. 15, \$0.10; No. 16, \$0.05; No. 17, \$0.03; No. 18, \$0.01
Avery's Saw Set and Punch..... \$50.00
Chieftain H. R. Co.'s Superior..... \$15.00, 50¢
Sharpeners, Knife.
Parkin's.
Applewood Handles..... \$6.00, 40¢
Rosewood or Cocobolo..... \$9.00, 40¢
Shaves, Spoke.
Iron..... \$45.00
Wood..... \$45.00
Barney's Stanley R. & L. Co..... \$45.00
Stearns..... \$45.00
Cincinnati..... \$45.00
Shears—
American (Cast) Iron..... \$75.00
Bernard's Lamp Trimmers..... \$3.75
Tinners'..... \$20.25
Seymour's, list Dec. 1881..... \$20.25
Heinrich's, list Dec. 1881..... \$20.25
Heinrich's Tailor's Shears..... \$33.45
First quality C. S. Trimmers..... \$80.00
Second quality C. S. Trimmers..... \$80.00
Acme Cast Shears..... \$10.00
Diamond Cast Shears..... \$10.00
Clipper..... \$10.00
Victor Cast Shears..... \$10.00
Howe Bros. & Hulbert, Solid Forged Steel..... \$40.00
Chicago Drop Forge & F. Co., Solid Steel Forged..... \$60.00
Clausen Shear Co., Japanese..... \$60.00
Clausen Shear Co., Nickel-plated, same list..... \$60.00
Electric..... \$10.00
Pruning Shears and Hooks.
Dillon's Combined Pruning Hook and Saw..... \$18.00, 20¢
Dillon's Pruning Hook..... \$12.00, 20¢
E. S. Lee & Co's Pruning Tools..... \$40.00
Pruning Shears, Henry's Pat. \$3.75; \$4.00 net..... \$3.75
Henry's Pruning Shears, \$4.25; \$4.50 net..... \$4.25
Wheeler, M. & C. Co's Combination..... \$12.00, 20¢
Dunlap's Saw and Chisel..... \$8.50, 30¢
J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25; No. 3, 9.25; No. 4, 11.25; No. 5, 13.25; No. 6, 15.25; No. 7, 17.25; No. 8, 19.25; No. 9, 21.25; No. 10, 23.25; No. 11, 25.25; No. 12, 27.25; No. 13, 29.25; No. 14, 31.25; No. 15, 33.25; No. 16, 35.25; No. 17, 37.25; No. 18, 39.25; No. 19, 41.25; No. 20, 43.25; No. 21, 45.25; No. 22, 47.25; No. 23, 49.25; No. 24, 51.25; No. 25, 53.25; No. 26, 55.25; No. 27, 57.25; No. 28, 59.25; No. 29, 61.25; No. 30, 63.25; No. 31, 65.25; No. 32, 67.25; No. 33, 69.25; No. 34, 71.25; No. 35, 73.25; No. 36, 75.25; No. 37, 77.25; No. 38, 79.25; No. 39, 81.25; No. 40, 83.25; No. 41, 85.25; No. 42, 87.25; No. 43, 89.25; No. 44, 91.25; No. 45, 93.25; No. 46, 95.25; No. 47, 97.25; No. 48, 99.25; No. 49, 101.25; No. 50, 103.25; No. 51, 105.25; No. 52, 107.25; No. 53, 109.25; No. 54, 111.25; No. 55, 113.25; No. 56, 115.25; No. 57, 117.25; No. 58, 119.25; No. 59, 121.25; No. 60, 123.25; No. 61, 125.25; No. 62, 127.25; No. 63, 129.25; No. 64, 131.25; No. 65, 133.25; No. 66, 135.25; No. 67, 137.25; No. 68, 139.25; No. 69, 141.25; No. 70, 143.25; No. 71, 145.25; No. 72, 147.25; No. 73, 149.25; No. 74, 151.25; No. 75, 153.2

Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s
list.....50¢10¢

Tap Borers—See Borers, Tap.

Tapes, Measuring—

American.....33¢40¢33¢45¢
Spring.....40¢
Chesterman's, Regular list.....26¢30¢

Thermometers—

Tin Case.....80¢80¢10¢

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, list.....50¢10¢25¢

Tinners' Shears, &c.—See Shears,
Tinners', &c.

Tinware—

Stamped, Japanned and Piced, list
Jan. 20 1887.....70¢10¢70¢10¢25¢

Tire Benders, Upsetters, &c.—
See Benders and Upsetters, Tire.

Tools.

Coopers'—
Bradley's.....20¢
Barton's.....20¢20¢5¢
L. & J. White.....20¢25¢
Albertson Mfg. Co.....25¢
Beatty's.....30¢
Sandusky Tool Co.....30¢30¢5¢
Shaves, Cincinnati Tool Co.....30¢

Lumber
Rine Peavies, "Blue Line".....\$ dos 20.00
Ring Peavies, Common.....\$ dos 18.00
Steel Socket Peavies.....\$ dos 21.00
Mail Iron Socket Peavies.....\$ dos 19.00
Cant Hooks, "Blue Line".....\$ dos 16.00
Cant Hooks, Common Finish.....\$ dos 14.00
Cant Hooks, Mail Socket Clasp, "Blue
Line" Finish.....\$16.00
Cant Hooks, Mail Socket Clasp, Com-
mon Finish.....\$ dos 14.50
Cant Hooks, Clip Clasp, "Blue Line"
Finish.....\$ dos 14.00
Cant Hooks, Clip Clasp, Common Fin-
ish.....\$ dos 12.00
Hand Spikes.....\$ dos 6 ft., \$15.00; 8 ft.,
\$20.00

Pike Poles, Pike & Hook, \$ dos, 12 ft.,
\$11.50; 14 ft., \$12.50; 16 ft., \$14.50;
18 ft., \$17.50; 20 ft., \$21.50.
Pike Poles, Pike only, \$ dos, 12 ft.,
\$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18
ft., \$16.00; 20 ft., \$20.00.
Pike Poles, not ironed, \$ dos, 12 ft.,
\$6.00; 14 ft., \$7.00; 16 ft., \$8.00; 18
ft., \$12.00; 20 ft., \$16.00.
Setting Poles, \$ dos, 12 ft., \$14.00; 14
ft., \$15.00; 16 ft., \$17.00

Swamp Hooks.....\$ dos \$18.00
Saw.

Atkins' Perfection.....\$ dos \$12.00
Atkins' Excelsior.....\$ dos \$6.00
Atkins' Giant.....\$ dos \$4.00

Tobacco Cutters—See Cutters, To-
bacco.

Transom Lifters—See Lifters,
Transom.

Traps—

Game—
Newhouse.....40¢40¢5¢
Onida Pattern.....70¢10¢
Game, Blake's Patent.....40¢10¢25¢

Mouse and Rat—
Mouse Wood Choker, \$ dosholes, 11¢12¢
Mouse, Round Wire.....\$ dos \$1.50, 10¢
Mouse, Cage, Wire.....\$ dos \$2.50, 10¢
Mouse, Catch 'em alive.....\$ dos \$2.50, 10¢
Mouse, Bonanza.....\$ gr \$10.00
Mouse Delusion.....\$ gr \$10.00
Rat, Decoy.....\$ gr \$10.00, 10¢
Ideal.....\$ gr \$10.00
Cyclone.....\$ gr \$5.25
Hotchkiss Metallic Mouse, 5-hole traps,
\$ dos, 90¢, in full cases, \$ dos.....75¢
Hotchkiss Imp. Rat Killer.....\$ gro \$18.50
Hotchkiss New Rat Killer.....\$ gro \$16.50
Schuyler's Rat Killer.....\$ gro \$15.00

Triers—

Butter and cheese.....25¢

Trimmers, Spoke.

Bonney's.....\$ dos \$10.00, 50¢
Stearns.....\$ dos \$10.00, 50¢
Ives, No. 1, \$15.00; No. 2, \$12.00.....\$ dos
55¢10¢
Dooglas.....\$ dos \$9.00, 20¢
Cincinnati.....\$ dos 25¢

Trowels—

Lothrop's Brick and Plastering.....
20¢10¢5¢35¢

Reed's Brick and Plastering.....15¢

Diaston's Br'k and Plastering.....25¢

Peace's Plastering.....25¢

Clement & Maynard's.....15¢20¢

Rose's Brick.....25¢

Brade's Brick.....25¢

Worrall's Brick and Plastering.....20¢

Garden.....70¢

Trucks, Warehouse, &c.—

R. & L. Block Co.'s list, '82.....40¢

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine.....BC. B.
No. 9, 1/4 and 1/2 B. Balls.....25¢ 34¢
No. 12, 1/4 and 1/2 B. Balls.....25¢ 33¢
No. 18, 1/4 and 1/2 B. Balls.....25¢ 32¢
No. 24, 1/4 and 1/2 B. Balls.....25¢ 32¢
No. 36, 1/4 and 1/2 B. Balls.....25¢ 31¢

No. 264, Mattress, 1/4 and 1/2 B. Balls.....52¢54¢

Chalk Line, Cotton, 1/4 B. Balls.....25¢

Mason Line, Linen, 1/4 B. Balls.....55¢

2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring
Twine).....15¢16¢

3-Ply Hemp, 1/4 B. Balls.....15¢16¢

Cotton Wrapping, 5 Balls to lb.....10¢

2, 3, 4 and 5-Ply Jute, 1/4 B. Balls.....10¢

Wool.....6¢4¢2¢

Paper.....15¢14¢

Cotton Mops, 6, 9, 12 and 15 lb. to do.....18¢

Vices—

Solid Box.....50¢10¢50¢10¢5¢

Parallels

Fisher & Norris Double Screw.....15¢10¢

Stephens.....25¢30¢

Parker's.....20¢25¢

Wilson's.....55¢

Howard's.....40¢

Bonney's.....40¢10¢

Millers' Adjustable.....40¢40¢10¢

Trenton.....40¢40¢10¢

Merrill's.....15¢30¢

Sargent's.....50¢10¢10¢

Backus and Union.....40¢

Double Screw Leg.....15¢10¢

Prentiss.....20¢25¢

Simpson's Adjustable.....40¢

Moore's.....30¢

Saw Filers—

Bonney's, Nos. 2 & 3, \$15.00.....40¢10¢

Stearns.....33¢40¢33¢40¢10¢

Stearns' Silent Saw Vices.....33¢40¢35¢

Sargent's.....60¢10¢
Hopkins.....\$ dos \$17.50, 10¢
Reading.....40¢10¢
Wentworth.....20¢10¢
Combination Hand Vices.....\$ gr \$42.00
Cowell Hand Vices.....30¢
Bauer's Pipe Vices.....10¢
Cincinnati.....25¢10¢

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters
Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enamelled, &c.

Cast Iron, Hollow—

Stove Hollow-Ware—

Ground.....55¢5¢60¢5¢

Unground.....55¢10¢55¢10¢5¢

White Enamelled-Ware—

Boilers and Saucepans.....60¢10¢5¢

Tinned Boilers and Saucepans.....40¢

Restless Hollow-Ware.....50¢50¢5¢

Gray Enamelled-Ware—

Stove.....50¢

Maslin Kettles.....60¢10¢10¢

Boilers and Saucepans.....40¢5¢

Enamelled—

Agassiz and Granite Ware, list Jan. 1,
1889.....33¢40¢10¢

Ironclad Enamelled Ware, list 33¢40¢10¢

Kettles—

Galvanized Tea-Kettles—

Inch.....6 7 8 9
Each.....55¢ 60¢ 65¢ 75¢

Standard Fiber—

Wash-Basins, 10 1/2 in.....\$2.00 \$2.25

Wash-Basins, 12 in.....2.25 2.75

Keelers, 11 1/4 in.....4.06

Cupboards, "Daisy," 8 in.....4.00

Spittoons.....4.00

Peck Measure.....3.50

Half-peck Measure.....3.50

Indurated Fiber—25¢

Spittoons, No. 2, \$ dos.....\$9.00

Basins, Ringed, \$ dos, No. 2, \$4.80;
No. 3.....\$4.20

Washbas, Nested, Nos. 0, 1, 2 and 3 (4
pieces), \$ nest.....\$7.50

Keelers, Nested, Nos. 1, 2, 3 and 4 (4
pieces), \$ nest.....\$3.70

Butter Bowls, 15, 17 and 19-inch (3
pieces), \$ nest.....\$2.25

Liquid Measures, pt., qt., 2 qt. and fun-
nel (4 pieces), \$ set.....\$3.00

Dry Measures, 1, 2, 4, 8 and 16 qts. (5
pieces), \$ set.....\$3.00

See also Patls.

Silver Plated, Hollow—

4 mo. or 5¢ cash in 30 days.

Reed & Barton.....

Meriden Britannia.....

Simpson, Hall, Miller & Co.....40¢5¢

Rogers & Brother.....

Hartford Silver Plate Co.....40¢5¢5¢

William Rogers Mfg. Co.....

Washers—

Size.....1/2 5-16 3/8 1/2 3/4 1

Washers.....6 5/8 5/4 3/4 3/8 3/4

In lots less than 200 lb., \$ lb., add 1/4¢, 5-
boxes 1¢ to list.

Wedges—

Iron.....\$ lb 3 3/4

Steel.....\$ lb 4 1/4

Weights, Sash—

Solid Eyes.....\$ ton \$18¢\$19

Well Buckets, Galvanized—See

Buckets, Well, Galvanized.

Wheels, Well.

8 in., \$2.25; 10 in., \$2.70; 12 in., \$3.21

Wire and Wire Goods—

Iron—

Market.

Br. & Ann., Nos. 0 to 18.....72¢4¢

Cop'd, Nos. 0 to 18.....70¢

Galv., Nos. 0 to 18.....62¢4¢

Tin'd, Tinned list Nos. 0 to 18.....62¢4¢

Stone.

Br. and Ann'd, Nos. 16 to 18.....72¢4¢

Bright and Ann'd, Nos. 19 to 28.....75¢

Br. and Ann'd, Nos. 27 to 36.....77¢4¢

Tinned.

Tinned Broom Wire, 18 to 21, \$ lb.....54¢

Galvanized Fence, Nos. 8 and 9.....65¢

Annealed Fence, Nos. 8 and 9.....75¢

Annealed Grape, Nos. 10 to 14.....75¢

Brass, list Jan. 18, 1884.....25¢

Copper, list Jan. 18, 1884.....25¢

Barb Fence.....See Trade Report

Annealed Wire on Spools.....50¢

Mailin's Steel and Tin'd on Spools.....50¢

Mailin's Brass and Cop. on Spools.....40¢

Cast Steel Wire.....50¢

Stub's Steel Wire.....\$0.00 to 2, 30¢

Steel Music Wire, Nos. 12 to 30.....65¢ \$ lb

Picture Wire.....New list 50¢

Wire Clothes Lines, see Lines.

Bright Wire Goods—

Standard list.....85¢

Wire Cloth and Netting.

Painted Screen Cloth, good quality,
\$100 sq. ft., \$1.60 @ \$1.75

Galvanized Wire Netting.....70¢10¢75¢

Wire Rope—See Rope, Wire.

Wrenches—

American Adjustable.....40¢

Baxter's Adjustable "S".....40¢10¢50¢

Baxter's Diagonal.....40¢10¢50¢

Coe's Genuine.....50¢3¢

Coe's "Mechanics".....50¢10¢3¢

Girard Standard.....65¢10¢

Lamson & Sessions' Engineers'.....60¢10¢

Lamson & Sessions' Standard.....70¢10¢

P. S. & W. Agricultural.....75¢ 7¢10

Girard Agricultural.....75¢ 7¢10

Lamson & Sessions' Agric'l.....

Bemis & Call's

Pat. Combination.....35¢

Merrick's Pattern.....35¢

Bridge's Pattern.....40¢5¢

Cylinder or Gas Pipe.....40¢5¢

No. 3 Pipe.....40¢10¢

Alken's Pocket (Bright).....\$6.00, 50¢10¢

The Favorite Pocket.....\$ dos \$4.00, 40¢

Webster's Pat. Combination.....25¢

Barclain's.....30¢10¢

Always Ready.....25¢5¢

Alligator.....50¢

Donohue's Engineer.....20¢10¢

Acme, Bright.....60¢3¢

Acme, Nickle.....50¢3¢

Walker's.....55¢2¢

Diamond Steel.....85¢3¢

Cincinnati Brace Wrenches.....25¢10¢

Taft's Vise Wrench.....55¢10¢3¢

Wringers, Clothes—

List March 11, 1889, 2¢ cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1889,
80¢15¢85¢

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw, per gal. 62 @ 64
Linseed, City, boiled.....64 @ 66
Linseed, Western, raw.....59 @ 60
Lard, City, Extra Winter.....51 @
Lard, City, Prime.....50 @
Lard, City, Extra No. 1.....45 @ 46
Lard, City, No. 1.....43 @ 43
Lard, Western, prime.....49 @ 50
Cotton-seed, Crude, prime.....30 @
Cotton-seed, Crude, off
grades.....22 @ 26
Cotton-seed, Summer Yel-
low, prime.....30 @ 36
Cottonseed, Summer Yel-
low, off grades.....30 @ 34

Sperm, Crude.....62 @ 64
Sperm, Natural Spring.....66 @ 68
Sperm, Bleached Spring.....71 @ 73
Sperm, Natural Winter.....77 @ 78
Sperm, Bleached Winter.....78 @ 81
Whale, Crude.....49 @ 50
Whale, Natural Winter.....49 @ 50
Whale, Bleached Winter.....51 @ 52
Whale, Extra Bleached.....54 @ 55

Sea Elephant, Bleached
Winter.....60 @ 62
Menhaden, Crude, Sound.....21 @ 23
Menhaden, Crude, Southern.....21 @ 23
Menhaden, Light Pressed.....26 @ 27
Menhaden, Bleached W'ter.....32 @ 34
Menhaden, Extra Bleached.....35 @ 36
Tallow, City, prime.....45 @ 48
Tallow, Western, prime.....45 @ 48
Cocoonut Ceylon.....63¢4¢
Cocoonut, Cochiti.....63¢4¢

Cod, Domestic.....32 @ 34
Cod, Foreign.....31 @ 34
Red Elaine.....31 @ 34
Red Saponified.....43¢4¢

Bank.....24 @ 25
Straits.....24 @ 25
Olive, Italian, bbls.....81 @ 83
Neatfoot, prime.....62¢4¢ 75

